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WEEDS TREES & TURF

Sod Producers Tackle Building Slump With Promotion

Seed Drills Remain Valuable for Slope Erosion Control

Weed Control for Functional Ponds and Lakes

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ISSN 0043-1753

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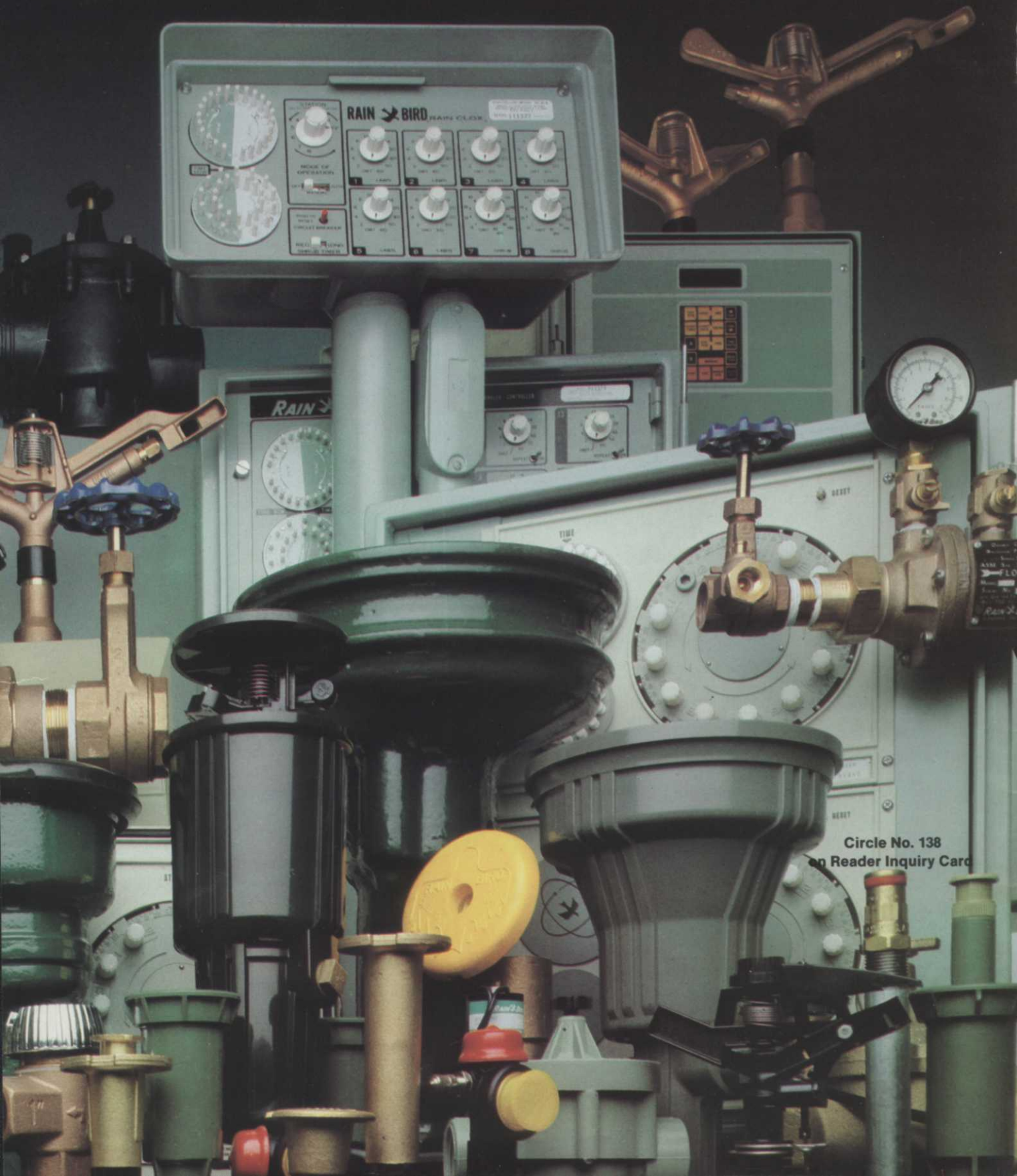

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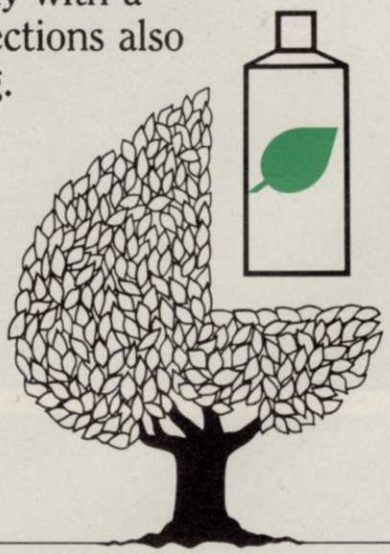

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Drive disease off fairways too, with Daconil 2787.®

Daconil 2787 Flowable Fungicide is the product of choice on tees and greens because it controls more diseases than any other turf fungicide. And in 12 years of continuous use, resistance has never been reported.

You can count on it to perform on fairways, too. To help you achieve a longer, more profitable playing season. A better looking course. More enjoyable play. Plus a better return on course investments already made.

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WT&T

CONTENTS

JUNE 1981/VOL. 20, NO. 6

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WEEDS TREES & TURF (ISSN 0043-1753) is published monthly by Harcourt Brace Jovanovich Publications. Corporate and Editorial offices: 757 Third Avenue, New York, New York 10017. Advertising offices: 757 Third Avenue, New York, New York 10017, 111 East Wacker Drive, Chicago, Illinois 60601 and 3091 Maple Drive, Atlanta, Georgia 30305. Accounting, Advertising Production and Circulation offices: 1 East First Street, Duluth, Minnesota 55802. Subscription rates: $15 per year in the United States and Canada. All other countries: $40 per year. Single copies: $2 in the United States and Canada; all other countries: $4.50. 2nd class postage paid at Duluth, Minnesota 55806 and additional mailing offices. Copyright ©1981 by Harcourt Brace Jovanovich, Inc. All rights reserved. No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopy, recording, or any information storage and retrieval system, without permission in writing from the publisher.
POSTMASTER: Send address changes to WEEDS TREES & TURF, P.O. Box 6198, Duluth, Minnesota 55806.

Outlook 6

Landscape Contractor News 12

Government Update 14

GREEN INDUSTRY NEWS

Change from bermudagrass to bentgrass at Masters irritates some pros . . . Nurserymen and florists plan major summer meetings . . . Nursery Marketing Council pushes promotion in drought 8

FEATURES

Suspicion Over Sodded Lawn Problems
In his speech prepared for the American Sod Producers Association this summer, Jerry Faulring, president of the Professional Lawn Care Association of America, stresses the importance of cooperation. 16

Sod Growers Learn Respect for Marketing
Slow times for sod growers have proven the necessity for marketing. Those interviewed tell what they do to boost sales. 18

Ground Covers in Low Maintenance Areas
Horticulturist Doug Chapman explains that not only do ground covers look attractive, but they also provide a real alternative to turf in sun or shade. 27

Establishing Seed on Steep Slopes
Seed drills will provide good seed/soil contact without high seed rates or water at the site, according to a reclamation expert. 30

Weed Control for Working Ponds
Managing ponds for all the functions they must perform entails care and expertise. 32

Lining Pond Bottoms Aids Weed Control
Two Michigan scientists relate their successes and failures in trying to control aquatic weeds with a screened netting. 36

Updating Old Business Ideas
Rehabilitation of properties, quantifying all costs, and pin-pointing profit contribution of equipment are a few of the topics Dave Johnstone addresses in this column. 40

Vegetation Management 44

Sod Producer News 46

Events 52

Letters 56

Products 61

Classifieds 66

Advertiser Index 68

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CASE STUDIES:

Tough rental trenchers that turn profits easily.

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OUTLOOK

By Bruce F. Shank, Editor

Verdict Is In on Bentgrass At Last Year's Western Open

A panel of experts led by Virginia Tech's Dr. Houston Couch has reported its conclusions on the embarrassing decline of Toronto C-15 bentgrass prior to the Western Open last year at Butler National. The study has to have been one of the most extensive ever in U.S. golf history.

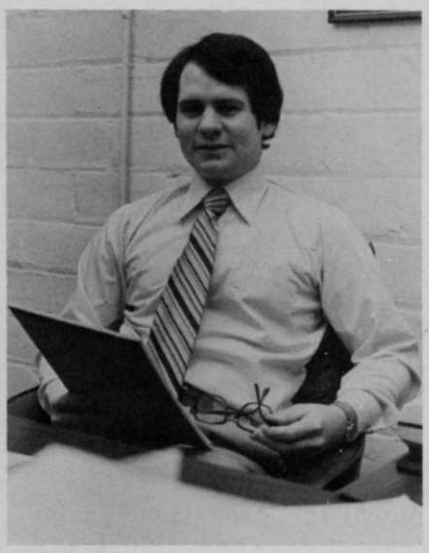
The early theories that the decline was caused by the fungal diseases, cool-temperature *Pythium* or red leaf spot were ruled out. Couch reports that the Toronto failed from root and crown diseases. Low iron content in the soil, high humidity, cool temperatures, high sunlight, poor drainage, and alkaline soil may have contributed to the disease, but the suspected incitant is now bacteria-like organisms called procaryotes. The infected Toronto was also traced to one sod nursery, Warren's. Parasitic nematodes, pesticides applied, and fertilizer used were also termed innocent.

The study proves turf management is more than a simple trade and research is far from complete on many aspects of turfgrass health. In addition, it highlights what cooperation among turf groups can accomplish. In this case the GCSAA, USGA Green Section, Chicago Superintendents Association, and the Chicago District Golf Association donated time and money to the cause. Virginia Tech, Ohio State University, and the University of Illinois should be recognized for their continued support of turfgrass pathology.

As public dollars for research shrink, associations and foundations will have to pick up more of the bill. Objective research performed by specialists outside of chemical company influence must continue. Not that chemical companies would be dishonest, but they go only as far as the profit does. They have stockholders, don't forget.

There is a case against large investments in research to solve rare instances. The Butler case has to be considered a rare instance for now. Many courses have renovated Toronto greens to Penncross or Penneagle. This, however, may be an incomplete solution with only short-term benefits.

The answer is "science." Is turfgrass management a science? In science you don't stop until all events can be repeated exactly and all reasons for the events are fully understood. Clearly we have not achieved this position yet. The practical benefits of knowing all turfgrass factors may appear limited from a curative viewpoint. But



the reason a superintendent or landscape manager is hired is to prevent disasters, not merely repair them.

To prevent disasters you have to be a scientist. That should be the goal of the modern turf manager. Basically, that is the position we take and try to support by our editorial coverage of turfgrass. We laud the efforts of the participants in the Butler situation.

Readers Grade Weeds For What Interests Them

The results are in from the *Readex* study on the March issue of *Weeds Trees & Turf*. Thanks to your responses, we can better meet your industry journal needs.

Few people trust self-promoting surveys. In the case of *Readex*, the research is performed by an independent firm specializing in publication performance, Reader Interest Research, Inc., in St. Paul, Minnesota. This firm has built a large data base on industry publications. It can detect weaknesses based upon comparisons with many other industry publications.

If you were not asked to participate in the March study and have comments to make on the magazine, you have two choices. The first is to wait to become part of a future Readex study (the group changes each time). Or, you can write to me in New York. Your comments are always welcome. August will be the next *Readex* issue.

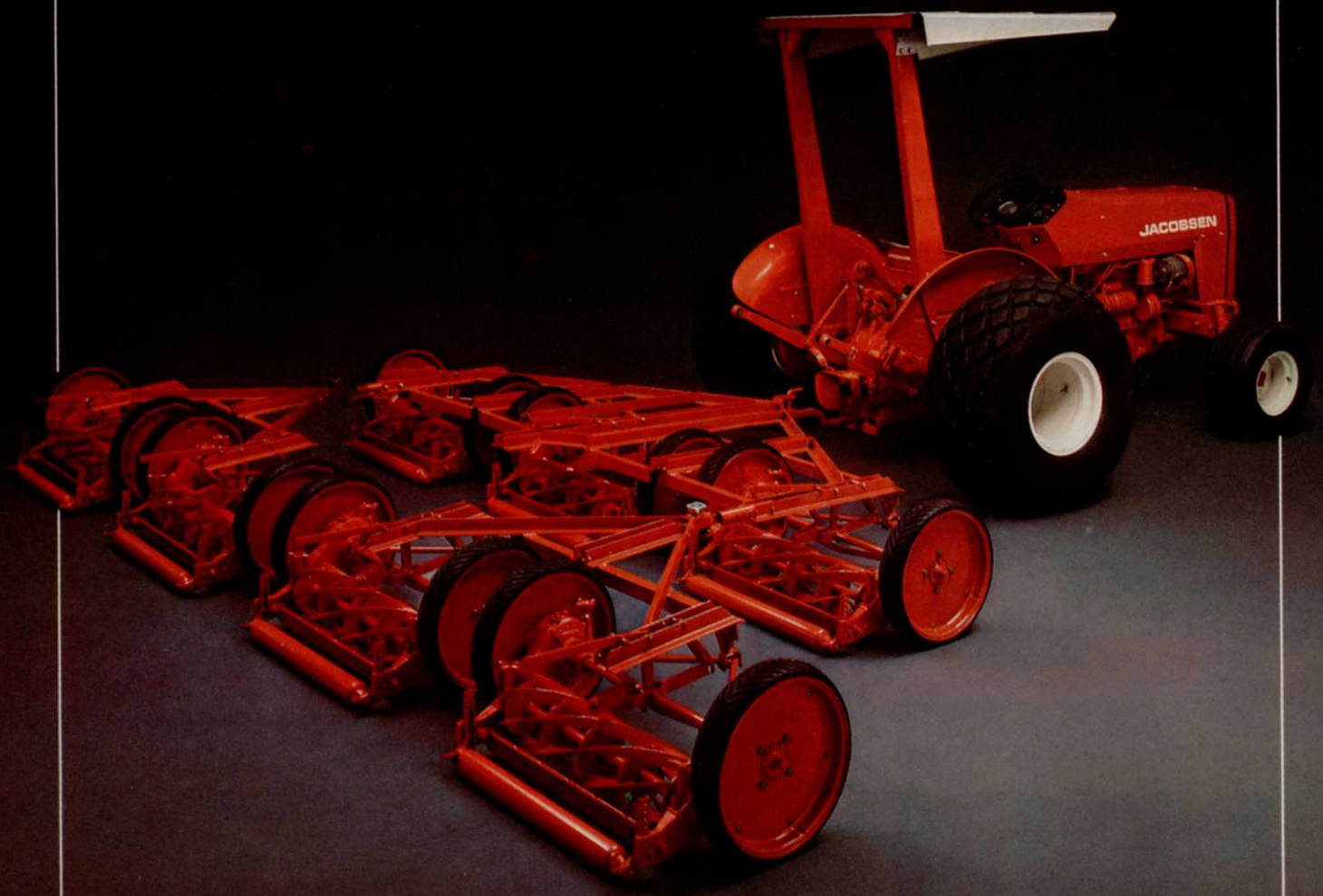
Average readership of national industry magazine features is 56 percent according to the *Readex* data base. The March features on turf weed control and fertilization received more than 80 percent readership. Only two out of 11 features fell below the 56 percent mark. Overall, 74 percent of the readers read the entire magazine spending more than one hour.

Typically a good advertisement will receive less than 20 percent readership, depending upon the size, color, and design. Nearly 50 percent read the PBI/Gordon ad on Trimec in the March issue. Nearly 46 percent read the Monsanto ad on Roundup. The Diamond Shamrock ad on Dacthal received 42 percent readership. Jacklin Seed Co., Ciba Geigy, Union Carbide, and Estech all had scores over 30 percent.

Obviously you're interested in weed control and fertilization during March. This, combined with market knowledge and common sense, helps us plan editorial content to best meet your needs.

The point is *Weeds Trees & Turf* may be the oldest magazine serving the landscape markets, but it is also the most current because it invests in research to meet your needs.

You just can't buy better gang mowers.



It's been proven time and again, day after day, acre after acre. You just can't buy better cutting gang mowers. For a very convincing demonstration, call your Jacobsen Distributor.

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Jacobsen Division of Textron Inc.

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Jacobsen: You just can't buy any better.

GREEN INDUSTRY NEWS

GOLF

Greens at Masters once too slow, now too fast

Although there is a definite hush and adherence to protocol at Augusta National, the conversion of its greens from Bermuda to bentgrass to add challenge to the course irritated some professionals during the Masters.

Some newspapers, such as the *Chicago Sun Times* went to lengths to infer that grass was a small matter of no general consequence and that courses should convert to Astroturf. Cute quips from sportswriters only added to the ignorance of the public to golf management.

The course maintained its tight policy that only the club chairman could speak on club matters, thus stopping any interviews with the superintendent. The full story is still not known and pieces of information, right or wrong, are coming from players rather than the superintendent.

The greens were renovated last August after an advisory committee and a number of other consultants met with Hord Hardin, the chairman. The Bermuda greens were fumigated with methyl bromide and seeded with Penncross. The greens were not rebuilt to USGA specifications for bentgrass. The club thought they could limit rebuilding to only those greens which showed problems.

Weather took over from there with an unusually hot September, rainy October, and cold winter. Club members were allowed to play on the greens in mid-October. Some inferred fungicides had burned some of the young Penncross but this has not been proven.

So far the problem has only been linked to bad weather and the poor soil structure of some greens.

If you consider the number of experts that were involved and who made the final decisions, superintendent Lloyd Mackenzie should be clear of any guilt.

In an article in *Golf Digest*, Hardin said those greens that were involved are likely to be rebuilt as originally planned.

Some players inferred that the greens have been hard for a long time. The lure of fast greens in the future may be tempered with consideration of the rootzone.

The Nebraska Turfgrass Foundation gave its Distinguished Service Award to Harold Glissmann (left) of Omaha during the Nebraska Turfgrass Conference. Keith Weidler, turf foundation president, presented the award.

CONVENTION

Nurserymen to hold annual in Cincinnati

The American Association of Nurserymen is planning its 106th annual convention and trade show at Stouffer's Cincinnati Towers July 18-22.

Themed "An Industry Together-Pathway to Profit," the convention will highlight educational sessions by each of the AAN family groups: Garden Centers of America, Wholesale Nursery Growers of America, National Landscape Association, and Horticultural Research Institute.

Topics will deal with concerns of the nursery industry and solutions to existing problems. Tours of Cincinnati-area wholesale, retail, and landscape businesses and tours for spouses attending the convention are also planned.

For more information, write American Association of Nurserymen, 230 Southern Building, Washington, D.C. 20005, 202/737-4060.

PROMOTION

Clifford advances in post at Mallinckrodt

Mallinkcrodt, Inc. has promoted Nick Clifford from senior business manager to business director for specialty agricultural products in the specialty chemicals division.

Clifford joined Mallinckrodt, a leading supplier of specialty agricultural chemicals to the turf and ornamental industries, in 1965. He has held a variety of sales and marketing positions in the specialty chemicals division.

CONVENTION

Florists to stress marketing at meeting

Themed "Advertising, Merchandising and Marketing: Strategy for Success," the annual meeting of the Society of American Florists promises to focus on the critical issue to the floral industry. Speakers and programs at the meeting planned for July 29 through August 1 at the Denver Hilton have been specifically scheduled for their expertise in marketing.

Somers White, a nationally known motivational speaker, will address the crowd on "Being Sold on Yourself and Selling to Others." Herb Mitchell, AAF, AIFD, will discuss "Teaching Your Employees to be Salespeople." George Kresch, professor of marketing at Colorado State University, will give a program on various types of advertising, analyze the good from the bad, and explain what members of the association can do.

Former President Gerald Ford will speak at the Friday luncheon. The New Varieties Exhibit on the first day gives growers a chance to compare their fresh flowers, decorative foliage, flowering plants, foliage plants, and bedding plants with their competitors.

Continues on page 12

No mixing, no burning, no hassle.

Introducing FOLIAN... the easy-to-use liquid fertilizer that's safe and effective on any kind of turf.

FOLIAN is a complete fertilizer. Its special formulation of N-P-K, sulfur and iron gets nutrients directly into grass tissue. And FOLIAN will not cause tip burn when used as directed.

Convenient to use

FOLIAN is the only fertilizer you'll ever need. It saves you time because there's no mixing or agitation required before using FOLIAN. And FOLIAN can be applied in more concentrated form than most other liquids. As a result, you can service more lawns per truckload with fewer wasted man-hours.

A clear solution of the highest quality, FOLIAN won't settle out in your tanks. It's compatible with most pesticides, too.

Greens lawns fast

Because of its patented formulation and foliar activity, FOLIAN greens up turf quickly—faster than dry fertilizers or suspensions. And at the recommended rates, FOLIAN supplies enough residual fertilizer in the soil to keep grass green and healthy for many weeks.

Good for your business

Your customers will love the results FOLIAN gives. And you'll appreciate FOLIAN's convenience.

Best of all, FOLIAN makes your lawn care service more valuable. It means repeat business from satisfied customers and greater confidence in you.

Give FOLIAN a try and discover how it can mean more green for both of you.

To find out more about how to get started using FOLIAN, call toll-free 800-228-2178 Omaha, Neb., 800-446-1841/800-446-1845 Hopewell, Va. or write Allied Chemical, P.O. Box 1000R, Morristown, N.J. 07960.

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LANDSCAPE CONTRACTOR NEWS

Landscape business outlook good for 1981

Members of the National Landscape Association are predicting another good landscaping year—one that gradually improves, according to the annual economic survey.

Last year, when the annual survey was taken, 85 percent of the landscape firms responding predicted increased sales in 1980. This year's survey, while slightly less optimistic—75 percent are predicting increases—shows that expections are still high among landscapers.

In 1980, after 10 percent of firms predicted sales increases, 12 percent reported increases at year's end. This year, 10 percent also predicted business increases.

For the second year in a row, landscapers have indicated that their best prospects for increased sales are in residential renovation landscaping. The second ranked growth potential in this year's survey was new commercial landscaping.

Here is a breakdown of predictions of increases over 1980 by region: Northeast—6%, Southeast—10%, Great Lakes—7%, Western Plains—11%, Other—20%. The national average is an increase of 10%.

Census shows growth in hort services

The 1978 Agricultural Services Census conducted by the U.S. Department of Commerce, Bureau of Census, indicates marked growth in landscape and horticultural services in 1978 over the previous census of 1974.

The number of firms involved primarily with landscape and horticulture services increased 39 percent from 1974 to 46,600. The gross receipts reported by these firms increased 97 percent for a total of $2.6 billion in 1978. The annual payroll reported by these firms was $947,000,000 or an increase of 94 percent from the previous census period.

The data is broken into three major categories: landscape counseling and planting; firms engaged in a variety of lawn and garden services—landscape planting and maintenance and, presumably, design services when sold in conjunction with the plants; and ornamental shrub and tree services, which were mostly arborist services.

The data prepared from the census indicates that the number of lawn and garden service firms increased at about the same rate as the other categories, while their gross receipts and annual payrolls increased at more than double the rate of the other two categories.

ASLA assumes lead role in design coalition

The American Society of Landscape Architects (ASLA) has become the leaders in 1981 for the major coalition of professional environmental design organizations in the U.S.

As secretariat of the Interprofessional Council on Environmental Design (ICED), ASLA has been charged with serving as the official communications center for this seven-member coalition. The council meets twice each year to address current issues of mutual concern, exchange information, and promote interprofessional collaboration in environmental design.

"ASLA is honored to serve as secretariat of ICED, since its purpose so completely parallels the attitude of landscape architects toward collaborative design," said ASLA President William Behnke.

The other six members of ICED include: the American Consulting Engineers Council, American Institute of Certified Planners, American Society of Civil Engineers, American Institute of Architects, American Society of Consulting Planners, and the National Society of Professional Engineers.

News *from page 8*

For more information, contact Barbara Kratchman, Society of American Florists, 901 North Washington Street, Alexandria, VA 22314, 703/836-8700.

NURSERY

Marketing council urges promotion despite drought

Citing an example of citrus losses from frost in Florida, Paul Dawson, director of marketing for the Nursery Marketing Council, is urging nurseries not to reduce advertising this spring due to drought conditions in much of the country.

"The wiser nursery leaders are saying this is a time to increase advertising budgets," Dawson said. "Now is the time to help consumers learn how to care for living plants with limited water resources, to sell those products which require less water, and to keep the public mindful of the important role their green environment plays in all aspects of their lives."

The Nursery Marketing Council represents bedding plant growers, sod producers, landscape architects and contractors, foliage growers, allied suppliers, and nursery retailers. A $270,000 national radio blitz is occurring on Saturdays in April and May.

CHEMICALS

Name given to new maker of Nitroform

FBC Chemicals, Inc. is the name of the new company formed to market and distribute products in the United States formerly marketed by Fisons, Inc., Bedford, MA, and the Boots Hercules Agrochemicals Co. in Wilmington, DE.

The new U.S. chemical company will have its corporate headquarters in Wilmington. FBC Chemicals, Inc. is the result of an announcement made last year by the two parent companies that they would merge their specialty chemical and agrochemical interests on a worldwide basis.

LAWN CARE

ChemLawn shareholders offer common stock

In an effort to generate working capital in the face of rising interest rates, ChemLawn Corp., Columbus, Ohio, is offering 750,000 shares of common

Continues on page 14

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ORTHENE–INSECT PROTECTION AT ITS BEST.

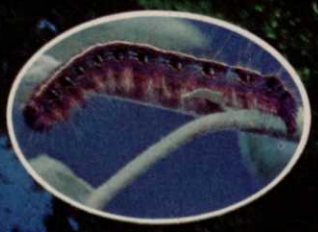
ORTHENE® Tree & Ornamental Spray is a giant step forward in protection. It kills a wide range of insects, on contact and with a lasting residual action. In fact, it's probably the only insecticide you need.

Here are some of the insects it kills: aphids, bagworms, birch leafminer, tent caterpillar, Douglas Fir tussock moth larvae, gypsy moth larvae, webworms, scales, California oakworm, spring and fall cankerworms, Nantucket pine tip moth larvae, and adult root weevil.

NEW FROM ORTHO

A companion product from ORTHO is ORTHOMITE™ Ornamental Miticide. It's the perfect solution for mite problems on flowers and ornamentals.

AVOID ACCIDENTS: For safety, read the entire label including precautionary statements. Use all chemicals only as directed.



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GOVERNMENT UPDATE

Pesticide testing bears problems

Tests on pesticide toxicity have been judged invalid because of too few or sick animals used, tests were not done at the maximum tolerated dose, incomplete microscopic examination, inaccurate recordkeeping, and poor monitoring, said Marcia Williams, director, Special Pesticide Review Division (SPRD) of the EPA.

She said that reliable data are also lacking with exposure information. Specifically, data are missing on individual exposure to pesticides in food, air, and water and on rates at which pesticides reach target organs. Another lack was a mechanism to factor in individual sensitivities or thresholds, she said. And it is difficult and expensive to design experiments encompassing variables such as wind, temperature, humidity, clothing, and type of application.

The expense, uncertainty, or unavailability of methods to detect chemicals or contaminants must be considered in economic/benefit information. Williams' talk was directed to the Great Lakes Pesticide Council.

USDA plans $4.3 mill. in IPM funds by 1990

A national urban Integrated Pest Management program starting in FY 1982 with $50,000 for 50 pilot workshops and no specific staff could grow into a project with a staff of 101 and a budget of $4.3 million by 1990, projects the U.S. Department of Agriculture. The plans were issued in a report, "Urban Integrated Pest Management," published by the Cooperative Extension Service, the University of Georgia-Athens.

The report listed seven urban IPM benefits: Offering clients alternative methods of pest control; saving on spiraling pesticide costs where other alternatives are available; public acceptance of commercial control programs that incorporate the concept of threshold pest levels; reduced exposure and environmental contamination; improved pest control; reduced pesticide storage and disposal problems; and delaying the development of pesticide resistance.

The State Cooperative Extension Services are in "a unique position to provide leadership in urban IPM," according to the report, and can do the job given sufficient staff and funds. However, it said, "assigning responsibility for urban IPM to already busy extension specialists in entomology, plant pathology, or other pest control disciplines without additional support has not succeeded in the past. Nor has vesting this responsibility in an urban horticulturist been successful; for such a person is not equipped to deal with public health, household and wood-destroying pests. The employment of multi-discipline-oriented IPM urban leaders in the states is essential."

Scientists examine exposure to 2,4-D

A study of two groups of workers who applied 2,4-D to wheat fields in two areas of the country has concluded that less than 1 gram of this herbicide enters the body of an average 175-pound worker.

Since evidence suggests that the amount of 2,4-D excreted is equal to the amount absorbed, scientists measured the urine of workers involved in ground or aerial applications. Ralph Nash, a U.S. Department of Agriculture chemist who specializes in analyzing pesticide residues, cited studies that 2,4-D is not metabolized in the human body, but rather passes through unchanged after a large dose is ingested. Studies on a similar herbicide, 2,4,5-T, substantiate this finding, he said.

Results showed that absorption is directly related to the type of job, the amount of herbicide applied, and the length of time it is handled. Those who mixed and loaded 2,4-D had the highest total absorption—0.02 milligrams per kilogram of body weight (or 1.6 milligrams for a 175-pound person). The least exposed group, pilots, absorbed less than one-third that amount.

Information from this study and others will be evaluated by the USDA, EPA, and other federal agencies. Absorption data will be compared with toxicity data when 2,4-D is reevaluated.

News *from page 12*

stock worth more than $12 million. 350,000 of the shares had been owned by principal shareholders.

Mary Jane Goldwaithe, vice-president and general counsel, said her company is optimistic about the stock, valued in January at $17 per share. The lawn care industry is recognized as a bullish market and ChemLawn is the largest company in the market with sales in excess of $100 million in 1980.

CONTAINERS

AAN group suggests new container sizes

The use of size designations in gallons for containers has been criticized by the Horticultural Committee of the American Association of Nurserymen.

The committee said that containers or pots which are markedly different in shape may have large variations in volume. The panel recommended a number designation for various pot sizes and shapes to restore direct comparison by nursery buyers. Several wholesale nursery firms have already dropped the gallon designation in their catalogs.

RECLAMATION

Hydrologist recycles native shrubs, grasses

A hydrologist with a Colorado coal company is using the seeds he collects on mining sites to revegetate the same land after mining is over.

Doug Bowman, environmental coordinator for Mid-Continent Resources, Inc., decided to develop his own source of shrubs and grasses when the state of Colorado began encouraging revegetation with natural materials. During the summer, he and a small crew pick seeds on land which will be disturbed from mining, and give them to a large nursery run by the U.S. Forest Service.

Half of the seeds the nursery nurtures it gives back to Bowman as seedlings for revegetation. The seedlings, already acclimatized to the high altitude, short growing season, and scanty rainfall, grow well when replanted.

Bowman faces another problem with a shallow, highly saline soil base. He is hoping to mix an abundant supply of wood chips with sewage sludge to make a topsoil. "About six inches of compost would help tremendously," he says. "Some land is nonrecoverable and we could use it there."

Number 9 hole, Island Course – Innisbrook Resort, Tarpon Springs, Florida.

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Circle No. 117 on Reader Inquiry Card

COOPERATION URGED TO SOLVE SUSPICIOUS SODDED LAWN PROBLEMS

By Jerome Faulring, president of the Professional Lawn Care Association of America. Based upon speech to be presented during the summer meeting of the American Sod Producers Association

As sod producers and lawn care businessmen are well aware, some antagonism has developed in the last four years due to Fusarium Blight infection in sodded lawns maintained by lawn care companies. No one has yet developed an accurate, objective opinion on this matter. There are at least a dozen theories as to why sodded lawns tend to become infected with Fusarium more readily than lawns established from seed and why lawn care is suspected by some to be part of the problem.

Having worked for both a major sod farm and a lawn care company, Professional Turf Corp./ Hydro Lawn, I have experience in both sides of the issue. Several hundred of the more than 1,000 lawns installed under my direction in the early seventies became infected during the first year of establishment with diseases, a large percentage of which was Fusarium. Very few of these lawns receive professional lawn care although a large percentage receive adequate homeowner care.

> If either sod producers or lawn care businessmen seek answers without the other, the non-active group is going to remain skeptical even in the face of facts.

This experience leads me to believe that the current circumstance is probably a natural phenomenon that possibly both the sod growers and lawn care industry enhance by way of unknown action.

The position I take, which represents the lawn care industry in general, is guilt can not be clearly laid to either the sod producer or the lawn care businessman, although both appear to have the problem in the marketplace. Furthermore, the concern is real and a scientific solution requires cooperation between sod producers and lawn care businessmen. If either party independently seeks the answers without participation from the other, the non-active group is going to remain skeptical even in the face of facts.

It is interesting to note that although Fusarium was first identified almost 14 years ago and has probably had more research interest than any other turf disease, it still remains the least understood of all the widespread diseases. This is true because it is very difficult to simulate field-like infections of Fusarium in the laboratory. Soil borne diseases, unlike foliar diseases, are difficult to study because of the very complex nature of the soil and multiple pathogen complexes found in the soil system.

There is a strong need for both industries to solve this problem. Professional lawn care is now a multi-billion dollar industry and continues to grow at an annual rate of 20 percent. Like the sod production industry, lawn care is here to stay.

It is a fact in my market area that lawn care businessmen refer dozens of homeowners to sod installers for lawn replacement. Likewise,

Lawn Care Industry view:

1. Fusarium susceptible monostands and polystands
2. Muck grown sod does not readily transfer to mineral soil and vice versa
3. Sod is often fertilized prior to harvest to enhance visual quality
4. Sod bed is over fertilized prior to laying sod to stimulate rapid visual improvement of new lawn
5. Harvest, transport and installation can create stress and susceptibility
6. Disease pathogen brought from point of harvest
7. Sod installed at time periods when grass wants to enter dormancy naturally but is stimulated by sod bed fertilizer and establishment irrigation

Sod grower view:

1. Lawns cared for by lawn care companies are over fertilized
2. Improper sod bed preparation
3. Too much post emergent herbicide
4. Repeated annual use of same pre-emergent herbicide
5. Sodded lawns are mature at time of installation compared with seeded lawns which enhances susceptibility to any disease
6. Mis-diagnosis — not Fusarium at all in some instances
7. Liquid application technique enhances potential for over application
8. Improper variety selection in some instances
9. Disease pathogen existent at planting site

installers and growers refer many homeowners to lawn care services after installations are completed. This inherent dependency on each other can be very harmonious and profitable for both groups.

Soil-borne diseases, unlike foliar diseases, are difficult to study because of the multiple pathogen complexes found in the soil system.

Several million homeowners receiving lawn care require re-establishment services. This number may increase due to drought damage being experienced in many parts of the country. Currently, a very high percentage of that work is done by overseeding, although many lawn care businessmen dislike this method. It is conceivable that sod producers could help relieve the lawn care industry of one of its headaches.

Interviews with more than a dozen sod growers, lawn care businessmen, and research specialists have revealed that the antagonism is created at the service level of staffing in the lawn care industry, often sales people misinformed or trying to skirt blame for a problem. The problem may be too complex for many to put into perspective. Answers to give these people are needed. The solution will be found more quickly if the lawn care industry and the sod industry work together. **WTT**

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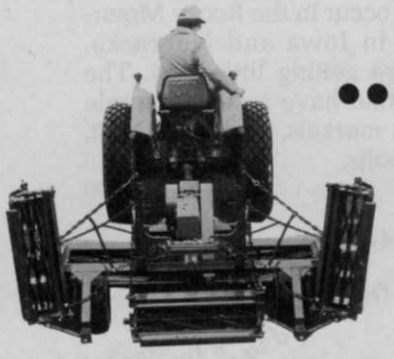

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Circle No. 107 on Reader Inquiry Card

RESPECT FOR MARKETING INCREASES AS SOD GROWERS FACE TOUGH TIMES

By **John Kerr,** Associate Editor

"Who said beauty is only skin deep! A sodded lawn is not only beautiful, it's an investment with deep-down benefits that will save you time and money. Sod provides instant beauty and instant value. Within a few hours, sod will transform your yard from bare spots and weeds to a lush, living carpet of mature grass. Sod is an investment which will instantly increase the market value of your property from 5 to 10 percent. Sod gives you a soft clean surface for family fun. Your house stays cleaner inside and outside. Sodding saves you countless hours of your personal time; the time you would take from business or pleasure for seeding, watering, and constant attention. High quality sod produced by members of the American Sod Producers Association is grown from premium variety, disease-resistant seed which is best adaptable to your area. So for instant beauty and instant value, consider sod.

—ASPA radio tape, entitled "Deep-down benefits"

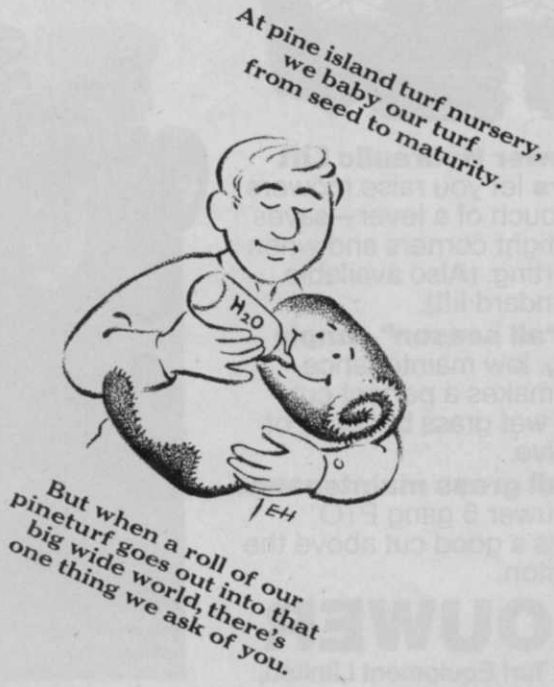
Marketing. The word sounds as foreign to some sod growers as topdressing would sound to Madison Avenue executives. Those who watch the sod industry say that up to 70 percent of growers do no marketing of their product. The realization that customers are no longer searching for truckloads of sod is changing that outlook for many sod producers.

Business had been growing steadily in the past two decades for those selling sod. Reliable customers such as landscapers and garden centers had consistently ordered and received a fine quality product. Pleased homeowners with freshly sodded lawns would pass their supplier's name to neighbors and friends. These customers are still pleased with the quality of the sod. Unfortunately, many are discovering that they cannot afford it or do not have the water to keep it alive.

High interest rates and the accompanying sag in home building have seriously hurt the market for sod. Commercial building has not suffered as much, but does not use as much sod, especially when the site is the heart of a metropolis. Competition, in the form of hydroseeders, presents another force against the grower. Yet the force that has hurt more than anything else is one that the President, economists, and competition can do nothing about—the weather.

Water tables stand so low in some areas of the East that 50 gallons a day per person is the enforced limit. What choice do these homeowners have when it's between washing themselves and watering their grass? In parts of New Jersey, officials have banned all watering and spraying. Water restrictions also occur in the Rocky Mountain states. Growers in Iowa and Nebraska, where few irrigate, are getting little rain. The parts of the Midwest that have received ample rain lie in competitive markets, such as Detroit, Chicago, and Minneapolis.

Continues on page 20



Promotional material used by sod growers varies from straightforward, informational pieces to light-hearted, humorous displays. Feedback from buyers often determines what type of angle growers will choose.

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For more information about our full line of aquatic herbicides, contact your local Union Carbide Argicultural Products Company representative or write direct.

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Circle No. 145 on Reader Inquiry Card

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To counter this negative climate, the sod growers must initiate or boost promotion for his business and profession. The American Sod Producers Association (ASPA) has recognized this need with more presentations on marketing at annual meetings and with development of brochures, slide-cassettes, booklets, and the radio spot reel which consists of five 60-seconds tapes.

Aggressive growers use a full program to create identification for their product and a positive image in the public eye. Michelle Williams of Meredith Sod Farms spoke at the 1980 midwinter conference on the full-scale campaign her company uses to promote its sod. From the mass appeal tactics of billboards, radio messages, and newspaper ads to the personal touch of cups, handkerchiefs, and T-shirts, everything Meredith gives out highlights the company's symbol of a frog and their motto, "It's easy to be green."

"Sod farmers need to establish consumer identification" says Williams. Although the size and funds don't warrant large-scale marketing for every firm, the ones who have kept their image in front of the public are the ones who are grabbing business in these dry times.

Some growers have switched their land to vegetable crops. Others have lowered prices to regain some capital. This not only hurts the grower but also the other growers in his area who are subsequently forced to reduce their prices. In the long run, everybody suffers from this action.

WEEDS TREES & TURF talked to a sample of growers in various parts of the country about their marketing programs. Many people have purchased the ASPA spot reel tape, which they have adapted to their own local needs in many cases. All are doing more to promote business.

"I think it is the most important end of the business," says Eicky Mund, president of Alboa Co. in Needville, Texas. Mund's sod business, headquartered outside of Houston, serves a growing marketplace that extends 500 miles to San Antonio, Dallas-Fort Worth, and New Orleans. This expansive area enables shipping nearly all the time regardless of bad weather in some parts. Mund feels fortunate for this as he calls sod "the most perishable of all produce."

Mund has been growing sod for 23 years and considers marketing more vital now than ever. "If you are not in the marketplace, you're at the mercy of truckers or anyone else who buys sod," he says. If a farmer does not market and can not sell his crop, he will take a much lower price from a trucker for his sod.

Although this southern section of the country is flourishing, competition in selling sod has grown fierce and lack of rainfall has created a rough climate for business. Mund estimates that in the last five years the number of sod growers in his area has doubled. High interest rates affect home building. And last year Texas experienced its worst drought in 20 years and the state was declared a disaster area.

Eicky Mund — "I have to step up marketing considerably to stay even."

Last year was the first time that Mund's business decreased. When water was cut off to the homeowners, there was little he could do. He had increased his marketing budget about 15 percent from 1979. This year he is watching and going harder after the retailer. He has opened new locations to sell smaller quantities. "You can't build a business if you have too many valleys and peaks," Mund says.

Mund advertises twice a week in newspapers, starting in the middle of March. This, aimed mainly at the homeowner, will be cut if heavy rain falls. He also sends direct mail to new homeowners. By mid-April, he is advertising several times a day on radio with a tape his firm has produced.

The outlook for business in 1981 is fair, Mund says. With other members of the sod association, he shares ideas and finds an incredible amount of help. "We're becoming an industry now," he says. "It's a large investment."

Anthony Peca, Jr., assistant general manager of Batavia Turf Farms in Batavia, New York, and his father have made their company a solid business through strong promoting. They combine a style of personable public relations with cooperative advertising to achieve a close rapport with their wholesale and retail buyers.

Peca travels to Ohio, Vermont, and Philadelphia to talk to potential customers. If a landscaper wants to do something new, Peca will explain proper methods to do it. If a group, such as a Lion's club, is working on an outdoor project, Peca helps them with the installation and returns the next year to see how it's been maintained.

Batavia Turf uses some 25 dealers to sell its product. The company supplies the dealers with advertising material—newspaper and radio—which is customized for local usage. The dealers are reimbursed for advertising within a limit.

Another way the company helps its dealers is reimbursement for what Peca calls, "sod volume credit." For example, if a dealer buys 10,000 yards of sod one year, the company may be reimbursed .01 cent a yard the following year; for

80,000 yards, a dealer may get .03 or .04 cents a yard reimbursement. The company sets these programs up on the basis that bills are paid by December 15th.

Peca will also talk to his dealers and potential customers during the winter. He'll set up temporary headquarters in a hotel and call on people for a few days in a row. During the winter they have more time to talk and listen to what Peca has to say. He attends shows in these various locations, also.

All the travel still means marketing. Peca says his company is using cheaper forms of marketing and keeping their name and logo in the public eye. One way to do this is to watch the market carefully and pour more marketing dollars in areas that are doing the most business. In a thriving region, marketing could be tripled.

Like most growers, Peca's firm advertises in the Yellow Pages, newspapers, and on radio. He thinks he may use the ASPA spot reel tape to show he's in touch with the industry as a whole. An addressograph with 6,000 plates enables the company to send out eight to ten mailings during the year. The flashiest eye catcher, though, looms over the New York State Thruway—a huge billboard. Peca says his competitors often hear, "Are you guys the ones with the sign on the highway?"

Peca says that, having grown up in the business, he realizes how important marketing is. "My father was the original Barnum & Bailey when it comes to promotion."

In Henderson, Colorado, LBT Turf Nursery owner Lora Leech finds her best marketing tool to be door hangers. Her sales crew scours the nearby Aurora, Englewood, and metropolitan Denver area for bare yards and drops off flyers. Last year they distributed 2,500 between July and September.

Lora Leech — "We explain that bluegrass can use less water than native grasses."

Ms. Leech calls the Denver area the Los Angeles of the 1960's in terms of its growth. She thinks 1981 will bring good sales. However, business has slowed and the water supply is low. "When business gets slow, we cut out the old grass and do the laying and installing for new work," she says.

A problem the Rocky Mountain sod industry has faced with the officials in Aurora has helped them unite and educate the public. The officials were limiting bluegrass planting in favor of natural grasses. Leech and other sod growers began teaching the public watering practices and ways of holding moisture in the soil. They also talked about the best ways of mowing. "We explained that bluegrass can use less water than native grass," she says.

"A lot of people are out of work without water so this is very important. If our growers hadn't done this, I would have had to do it myself. Since we've spoken together, it gives a little more strength to what is said."

In Sumner, Washington, where Emerald Turfgrass Farms is headquartered, general manager Bob Johnson and sales manager Richard Giffin market for fun as well as benefit. In each monthly mailing, Giffin includes a humorous card which has little to do with turf but much to do with marketing. It grabs the customer's attention, gives him something to look forward to, and makes the Emerald Turf name a pleasant one.

The ASPA tape in its straightforward message wasn't appropriate for Emerald's market, Johnson says. He prepared his own radio tape in conjunction with a station to hit a particular market. In the spring, he focuses on the homeowner; at times of grand openings or special events he focuses on the landscape contractor and home builder—those who sell sod and help develop a radio message.

Johnson aims advertising at the large buyer and picks special editions of newspapers and trade journals, which people will save, to include his company. The landscape contractor and home builder have been Johnson's main market for the past 20 years and he sees no reason to create new markets. "I look at opportunities to reinstate our name," he says. There is no set pattern or formula for this. "If I see it looks good, I jump in."

Emerald sends direct mailings to builders, home and commercial landscapers, and landscape contractors. The company's contact with homeowners comes through the Yellow Pages and referrals from landscapers.

A distinct logo, "ET," provides solid name recognition. The logo goes on hats, pens, matches, and decals for customers' trucks. Emerald Turfgrass has also made a short movie about lawns that's enjoyable for viewers.

Johnson says business is good in the Puget Sound area. Competition is tough but hasn't caused a drastic impact on his shipping. Uniqueness and good naturedness seem to keep the company apart from others.

On the other side of the country in Sussex, New Jersey, Charles Lain, owner of Pine Island

Continues on page 24

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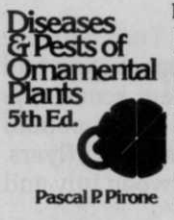

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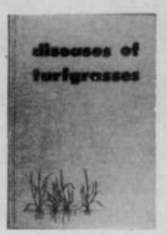

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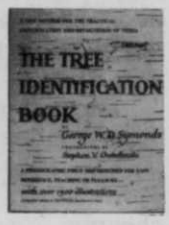

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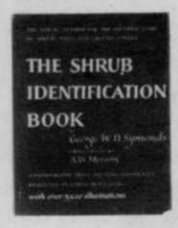

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WTT

Turf Nursery, has been affected by competition but hurt badly by the lack of water. "It has pretty much shut the market off with restrictions," he says. Nevertheless, Lain's goal is to educate people why they should have sod and he does this with advertising.

Charles Lain — "Every person should build a little into marketing and bring their price up."

"Too many are unaware of the importance of marketing," Lain says. "There's no comparison between the American farmers and any in the world in his ability to produce." Yet Lain estimates that 90 percent of agricultural farmers need to promote their business more and 70 percent of sod farmers don't do enough, if any, advertising.

Since the drought has hit, Lain has put half his acreage into vegetable crops to build up cash flow. He nearly doubled his marketing budget in 1980 and experienced 15 to 20 percent less sales. He doesn't blame it on his marketing techniques, having been in the field 10 years with Weyerhauser, but on the water restrictions. "I have no restrictions on irrigating on this end, but they are heavy on the other end."

Residents in Lain's New Jersey area are allowed 50 gallons per person per day. There is a $10 fine for each time this limit is surpassed. Towns are enforcing it and promoting it through local papers. "I'm being a realist," says Lain about his change to vegetable crops. "The production of food has to take precedence over watering plants."

Lain will return to former marketing plans when water returns to his soil. In the meantime, he fears that some new growers who have not done much promoting will sell their sod cheaply.

He used to send six to eight mailings a year, which he thought were extremely successful in keeping his name in front of customers. Every letter told the value of sod over a seeded lawn. He also sent popular articles with information on sod, and belonged to many groups.

Continues on page 26

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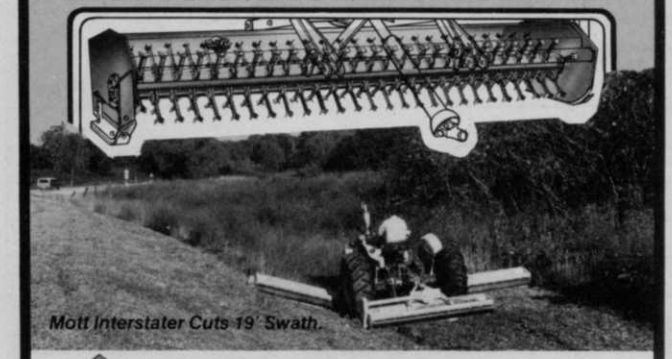

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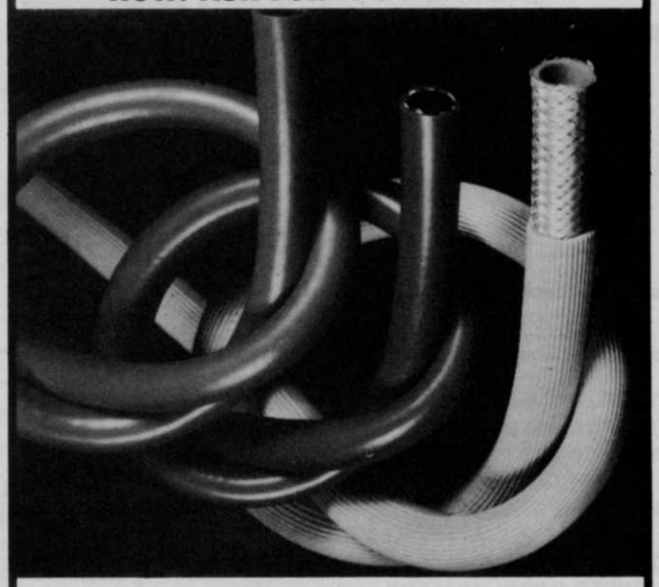

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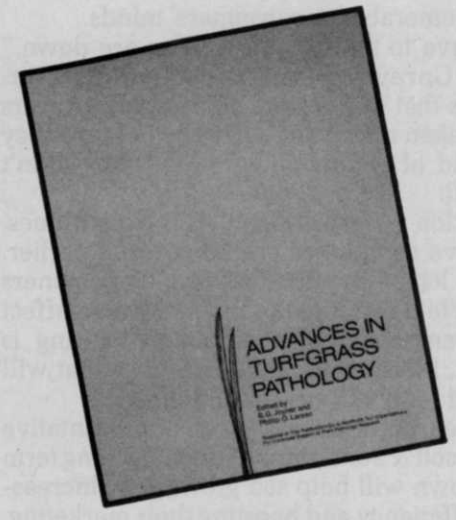

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WTT

Circle No. 102 on Reader Inquiry Card

Sod Marketing *from page 24*

"We're producers," he says. "It's time we realize it's up to the grower; we're the ones to promote it. We should be doing it on a national basis to show the value of sod. We're selling instant beauty, a perfect yard year-round."

"There is tremendous potential in the market, but we have to develop it. Too many farmers think of it (marketing) only when times are tight.

The largest eye-catcher Batavia Turf Farms uses stands off of the New York State Thruway. Competitors often hear, "Are you the ones with the sign on the highway?"

Nobody wants to see the sod industry go the way of the automobile industry in this country. However, when economic times are rough, people find substitutes for what seemed to have been always essentials. These are the times that consistent service and steady promotion become especially memorable in consumers' minds.

"You have to market when sales are down," says Bob Garey, ASPA's executive director. Garey says that in the good years many growers have not taken marketing seriously because they were afraid of getting calls for sod they didn't have to sell.

"Promotion is very critical," Garey continues. "Progressive companies are advertising earlier. There's a lot of impulse buying, homeowners looking." He doesn't see to much adverse effect from present conditions. Although housing is way down, large commercial buildings that will be finished soon will require much sod.

Steve Dearborn, a sod market representative for O.M. Scott & Sons, thinks that in the long term the slowdown will help sod growers by increasing their efficiency and boosting their marketing. Because of the slowdown and new competition, Dearborn says marketing is "the key to the future of the business." **WTT**

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GROUND COVERS ADORN SURFACES IN SHADY, LOW MAINTENANCE AREAS

By **Douglas Chapman,** Horticulturist, Dow Gardens, Midland, MI

Ground covers are a real alternative for turf in sun or shade to reduce maintenance. Many shade-loving ground covers grow especially well around trees while not competing heavily with the tree or shrub for moisture and nutrients. Further, these ground covers don't require mowing, thus mower damage to trees is eliminated. A few of the outstanding shade-tolerant ground covers include Lily-of-the-Valley (*Convallaria majalis*), English Ivy (*Hedera helix*), Plantain Lilly (*Hosta Species*), Japanese Spurge (*Pachysandra terminalis*), Primrose (*Primula species*), and Periwinkle (*Vinca minor*). All of these ground covers are less competitive than turf; therefore, shallow-rooted dense trees, e.g. maple, Horse Chestnut, and beech, thrive when planted as companions.

Lilly-of-the-Valley (*Convallaria majalis*) is especially well suited to dense shade. The foliage is comprised of two large upright oval leaves, 8 inches long and 1 to 3 inches in width. When planted, this ground cover quickly masses in, being particularly effective during summer, from mid-May thhrough early September. The fragrant flowers are waxy white and bell-like hanging off upright spikes. The spikes usually are as tall or slightly taller than the foliage. Flowering occurs from early May through mid-June, depending on how far north one tries planting these extremely hardy herbacious perennials. To keep these plants vigorous and dense, one should consider fertilizing once every three to four years. Although Lily-of-the-Valley will survive in partial sun, it thrives in full shade. The soil should be moist, deep, and fertile. The above requirements and characteristics make Lily-of-the-Valley extremely effective during the growing season as companions for many of our dense trees, e.g. maple, beech, and redbud. The main drawback with this plant is that a foliar disease often affects the

Baltic ivy (*H. helix* 'Baltica'), an extremely hardy cover and a weak climber, grows in exposed areas and will remain evergreen throughout the harshest of winters. (Above)

Japanese Spurge *(Pachysandra terminalis)*, one of the best ground covers for deep shade, complements this Redbud *(Cercis conodensis)* and shallow-rooted trees in the landscape. (Right)

leaves during mid to late summer, causing yellowing and dieback, reducing the effectiveness of the dark green leaves. After the first frost, the plants die down to soil level, leaving the ground somewhat bare throughout the entire winter, but during the growing season, this is one of the most dense ground covers.

English Ivy *(Hedera helix)* is perfectly hardy as far north as central Michigan. It thrives in dense shade, being somewhat evergreen when planted in protected areas, such as the north or northeast side of buildings. English Ivy prefers a moist-deep-rich fertile soil and, again, is a good companion for many of the dense, yet lowland species, such as Red Maple, beech, and hawthorn. If grown north of Columbus, Ohio, winter protection is often required to reduce dieback or burning. English Ivy is a particularly effective ground cover when planted with narcissus or minor spring bulbs. Baltic Ivy *(H. helix 'Baltica')* is an extremely hardy form which is a weak climber. One can use Baltic Ivy in exposed areas and it will remain evergreen throughout the harshest of winters.

Plantain Lily *(Hosta decora)* is an herbacious perennial which thrives in semi- and full shade areas. The leaves start growing in late spring and provide dense, rich light green ground cover, 6 to 8 inches in height, for the entire growing season. Plantain Lily thrives in areas with moist, fertile well-drained soil. Usually, it is most effective as individual clumps that colous together. Blue flowers are borne on spikes about 18 inches long, flowering during early summer above the foliage. These 2-inch long bell-shaped flowers are a good contrast to the foliage and can be a welcome addition for the summer months. There are many cultivars of Hosta which are varigated, increasing the variability of textures and color.

Hall's Honeysuckle *(Lonicera japonica* 'Halliana') is an extremely vigorous ground cover which can effectively be used on hillsides or areas which are difficult to mow. It establishes rapidly but often escapes confinement; therefore, continuous pruning (restriction) is important if one does not want this aggressive ground cover to take over the entire landscape. It thrives in semi-shade or full sun areas. Hall's Honeysuckle roots readily in rich, well-drained fertile soil. It is not a good companion plant for small shrubs or trees as it is extremely vigorous and depletes the soil of moisture and nutrients. This aggressive characteristic can literally kill many of the small shrubs and trees. South of Detroit, Hall's Honeysuckle is semi-evergreen but is perfectly hardy north to Midland, Michigan. This ground cover should be used in mass plantings, e.g. as a substitute for turf on hillsides, with discretion.

Japanese Spurge *(Pachysandra terminalis)* is a perfectly hardy, lush evergreen ground cover, reaching 6 to 10 inches in height with leaves 2 to 4 inches long. Flowering occurs during late April or early May. These white spikes are particularly effective as they are borne above the old foliage. By many, pachysandra is considered the most effective evergreen ground cover, but one must realize, it can be overused. It is an outstanding companion for shallow-rooted trees, such as magnolia, maple, beech, and Common Horsechestnut. It will do well in partial or dense shade. Pachysandra is particularly effective when narcissus are planted prior to its planting and allowed to grow up through. It thrives in deep-rich-fertile well-drained soil. Once established, pachysandra fills in rapidly.

Polyanthus Primrose *(Primula polyantha)* is another extremely effective ground cover which thrives in shady, moist areas. The leaves are tufted at the base, being a light green, somewhat feathery, dying back to the ground mid-summer, leaving bare ground for much of the growing season. Primrose break dormancy early in the spring, prior to tree bud break and, therefore, are extremely effective in woodsy or rock garden areas. The five-petal, light lobed flowers come in many different colors with pink and yellow being quite common. There are over 500 different species of primrose with the most commonly available ones including *Primula polyantha*, reaching 6 to 12 inches in height; Cowslip *(P. veris)*, reaching 8 inches in height with deep yellow (very fragrant) flowers; and English Primrose *(P. vulgaris)*, again, having sulphur-yellow flowers, 1½ inches across, being very effective from mid-April through June. Primrose are particularly effective for intimate areas near water (ponds or streams).

Periwinkle *(Vinca minor)* is an extremely aggressive evergreen ground cover which thrives in semi-shade. It does well in fertile well-drained soil. It has blue flowers during mid-May and has a rich evergreen foliage which survives even when subjected to the rigors of winter. Periwinkle can be planted in almost any location. It is not a good companion for shallow-rooted plants but is extremely effective in large areas when used in mass plantings or as a companion for some of the deeper-rooted trees, e.g. oak and pine. Its dark, rich green foliage, which reaches 8 to 10 inches in height, is neat and effective with few disease or insect problems. There are many varieties, with 'Bowles' being the most readily available in the trade. A drawback of 'Bowles' variety of periwinkle is it is somewhat tufted, not nearly as aggressive a grower as is the species form.

All of the aforementioned ground covers thrive in semi or full shade and prefer moist, rich fertile soil. They are outstanding as companion plants to reduce maintenance while improving the micro climate, thus helping many trees thrive. **WTT**

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DRILL SEEDING STEEP SLOPES FOR ESTABLISHMENT OR INTERSEEDING

By **Richard L. Brammer,** General Superintendent, Reclamation Division, Randall & Blake, Inc., Littleton, Colorado. A speech presented during the 1981 Annual Meeting of the International Erosion Control Association.

As seeding contractors, Randall & Blake, Inc. have and will go to great efforts to plant seed into the soil using a drill. In the low precipitation areas that we often operate in, we need all of the help we can get to promote successful seedling establishment.

The prime reason for drill seeding is the positive placement and uniform dispersion of seed at a regulated depth into the soil where levels of moisture are more consistent and the actions of wind and water will not remove the seed from the treated area. These simple considerations provide for a more consistent stand of established plants versus any broadcast method and develop a seedling that is more drought hardy. The seedlings are rooted *in the soil* not on the top of the soil trying to root down into the surface.

Many people argue that in nature all seed is broadcasted in one way or another. This is a valid point; however, natural broadcasting of seed is very inefficient in terms of the amount of energy that a plant must expend in order to reproduce. A single plant may produce thousands of viable seeds. However, only a few of these may ever get the chance to germinate due to the uncertainty of being broadcasted into a habitat conducive to germination. In essence, drill seeding is an improvement upon natural seed dispersement by placing all of the seed into niches favorable to not only germination, but also a viable existence.

It is a common notion that doubling the seed application rate when broadcasting will obtain the same results as drill applications. Even if this was always certain, it can be extremely cost ineffective when broadcasting with some native species that cost $60.00 or $120.00 per pound. The total seed cost could reach $200.00 to $300.00 per acre. From another standpoint, water for hydroseeding may be miles from the treatment site. Exposure of some seed (for example, blue grama) to even short periods of soaking will trigger germination, and that combination with powdery dry soils can be lethal in zeric areas. These factors all culminate in whether you have to go back and try again — we want to give it the best shot the first time, especially when our work is the best testimony of our capabilities.

Safety is primary. If the slope is too steep or too rocky, then use other methods of seeding.

Throughout the plains and intermountain valleys of the western states "drill seeding" has been utilized as the major method of planting seed into the soil. It is not a new idea, as horse drawn seed drills can be found hiding around in farm lots. Improvements have been developed as agricultural trends and construction methods improve. The drill was improved upon following the dust bowl era and the Great Plains Program promoted returning marginal agricultural land back to its best use — grass lands. Reclamation along the Interstate Highway System increased the use of native grasses and likewise prompted further improvement of the drill. The Vegetative Rehabilitation and Equipment Workshop has improved the Rangeland Drill for use after forest fires and shrub land conversion to improve grazing capacities on native rangeland. But to date, there is still a gap in the commercial development of an "off the shelf" drill that will work with the native collected species (blue grama, little and big bluestem) and withstand the continual rigors of rocks, slopes and rough ground that are the result of mining or other extreme soil disturbances.

If you have seen one seed drill you have *not* seen them all. Some handle smooth seed, some trashy; some have 3 point hook-ups, some are towable; some work and some don't. Let's consider the types of feed systems. The simple open throat will feed smooth seeds (wheatgrasses, cereal crops and bluegrasses) and adjusts by opening or closing the plate in the bottom of the box. A picker wheel is required to feed the sticks and stems that are common with native collected seed (blue grama, galleta, bluestems). These systems are more complex to adjust and require some imagination to calibrate, such as adding filler materials like sawdust or peatmoss that will

help give uniform feeding with some fluffy seeds. The seed boxes should have dividers so that on a slope all of the seed doesn't slide to one end of the box.

Most dryland seeding is performed with a mixture of different sized seed, and an agitator is required to keep the seed from segregating in the box. Many extremely small seeds, like sand dropseed, should be planted separately through a small seed box or it will shake out of slick seed mixes like wheatgrasses, unless there is a lot of fluffy seed in the mix such as blue grama. I will always advocate the value of experience on the job site because seed of the same species will vary in trash content from lot to lot. Blue grama is a prime example because only a limited acreage has been alloted to seed production and the rest has to be collected from native stands. To separate it down to 99% clean destroys more seed than you save in *looks* by having "*clean*" seed. The germination is still there when it is tested for pure live seed even if trashy material remains attached.

If slope is less than 3:1, seed drills will provide good seed/soil contact without high seed rates or water at the site.

The drop tubes which connect the seed boxes to the planting bottoms need to be very flexible to bend and withstand the impacts when going over rocks and rough ground. The diameter should also be large enough to let the sticks and stems go through. The planting bottoms also need broad enough openings to allow the stems and fluff to pass. There are modifications that help the standard bottom. Most bottoms are steel castings and will break after traversing miles of rocks and rough ground. These castings are not always easy to find when you are miles from a farming area. One fabricator (Tye, Inc.) produces a welded steel bottom that will take more abuse and can be repaired with a welder. The planting bottoms have depth bands on the disc that control the depth of seed placement. These are also easy to destroy in rocky ground and some are stronger than others. Packer wheels can be used in sandy soils to assist in depth control, but rocks will destroy them in a short time. Individuals that specify their use should check the site conditions first.

The limitations of where you can operate a drill are very basic. If it is too rocky for the disc to place the seed into the soil, then call in the broadcasters. If it is too steep to operate equipment safely (then someone should have designed the slope flatter, which is a subject in itself), then your options are more costly, labor intensive, and the resulting vegetative cover is less effective due to the repose of the slope.

Basically, if you can traverse the slope with a tractor, either wheel or crawler type, you can drill it — *safety is prime*. Wheel tractors with dual wheel arrangements can work a 3 to 1 slope in most instances. You can go beyond this with 4-wheel drive, a good experienced operator and a texture of soil that is stable enough to support the weight. Sand, gravel, round rocks, or mud will put you at the bottom of the hill in a hurry. Crawler type equipment will handle 3 to 1 and even steeper slopes depending on the soil texture. A low profile, wide tracked John Deere 350 is our main tool for drilling steep slopes; then safety becomes our limit. Specification writers should know safety limits and not try to exceed them. I have seen many specifications calling for drill seeding on 2 to 1 slopes — that is not a responsible recommendation and personal injuries are not a good tradeoff for lack of experience.

When you start thinking that a tractor can be held onto a slope by cables from above; then "call in the hydroseeders" and utilize a slope chain to bury the seed: it is less costly than an injury. There are some very complicated machines being tested by the Inter Agency Equipment Development Center at San Dimas, California, that are held onto slopes with a grade-all. These are a good alternative to hydroseeding and slope chaining, but are limited in reach.

Another excellent practice with a drill seeder that will see expanded use is *interseeding*. Again, this is an old range improvement practice and the term refers to planting more seed in poorly established stands of grasses. *Minimum tillage* is another term for planting in standing vegetation. A good example is in mine reclamation where the first treatment did not produce the required density of plant establishment or the diversity of plant species is lacking. By utilizing the litter remaining from weedy annuals and the protective cover of the desirable species, new seed can very effectively be planted with minimum tillage. A specially designed minimum tillage drill is equipped with rippers or discs that only disturb the soil in a narrow band in front of the planting disc. This treatment is very effective when growing your own mulch cover by planting annuals prior to planting the perennial species. This is a very effective way of increasing soilbiomass and microbial levels in subsoils of low productivity. It is an attractive alternative when mulch prices rise due to trucking costs or excessive competition with the livestock industry during drought years. **WTT**

WEED CONTROL FOR WORKING PONDS: GUARDING FUNCTION AND APPEARANCE

By **Jim Schmidt,** Technical Director, Applied Biochemists, Inc., Mequon, Wisconsin. He is author of the book "How to Identify and Control Water Weeds and Algae."

Ponds play an important role in the functioning of many modern facilities. They serve a variety of uses including cooling of industrial machinery, reservoirs for fire protection, treatment of wastes, and/or retention of storm water.

Consequently, the management of these ponds can be an important consideration in maintaining production, protecting costly equipment, lowering fire insurance rates, complying with effluent standards, or preventing floods. Frequently these ponds serve multiple purposes and must be managed accordingly.

Since many of these water bodies are located adjacent to the plant, their appearance can reflect the environmental consciousness of the company. Visiting customers and the surrounding community often obtain their first impression of an industrial facility based upon its external appearance.

Plant managers or industrial engineers are often the ones responsible for the upkeep and maintenance of these ponds. Unfortunately, many of the problems which confront them are of a biological nature, an area outside their training and expertise. While familiar with the mechanics such as flow rates, pump capacities, retention times, etc., when faced with nuisance aquatic weed and algae growth they are at a loss for solutions.

The very nature and uses of many industrial waters increase their potential for having nuisance vegetation problems. Cooling ponds often maintain relatively high water temperatures (60°F-90°F) year round. Aquatic plants, like terrestrial vegetation, respond to these warmer temperatures by growing faster and more persistently throughout the year.

Storm water retention ponds fed by runoff, sewage treatment lagoons, and ponds located in fertilized, landscaped areas receive high levels of nutrients (nitrogen and phosphorus) which enhance aquatic growth. Both warm water and high nutrient concentrations contribute to aquatic vegetation problems.

Mechanical rather than chemical solutions are often sought since most engineers are more

Practical functions of ponds include irrigation and drainage retention as in the case of this pond. These functions require extra management attention.

Herbicides for Pond Weed Management

Trade Name	Target Weeds	Precautions	Manufacturer
Algimycin (chelated copper)	Algae	Use when water is above 60 degrees F.	Great Lakes Biochemical
Amitrole	Waterhyacinth, cattails	Not for irrigation or drinking water.	Union Carbide
Aqua-Kleen (2,4-D)	Bladderwort, coontail, waterchestnut, watermilfoil, waterstargrass, waterlilly.	Not for irrigation or drinking water.	Union Carbide
Aquashade	Algae, submersed weeds, brittle naiad, pondweed.	Apply late winter, early spring.	Aquashade
Aquathol	Bassweed, coontail, watermilfoil, naiad, pondweed.	Not for irrigation within 7 days.	Pennwalt
Aquazine	Algae and many weeds.	See label.	Ciba Geigy
Banvel-720	Waterhyacinth, alligatorweed, arrowhead, water pennywort, smartweed, cattail.	Some state labels, only.	Velsicol Chemical Corp.
Casoron G-10	Elodea, naiad, watermilfoil, coontail, pondweeds.	Not for irrigation or drinking water. Preemergence.	Thompson-Hayward
Cutrine-Plus	Algae, Chara.	With granular treat pond in portions.	Applied Biochemists
Diquat	Bladderwort, coontail, elodea, naiad, pondweeds, watermilfoil, pennywort, duckweed.	Ten day wait needed before pond can be used for swimming, irrigation, drinking.	Ortho Div., Chevron
Hydrothol	Algae, Chara.	Fourteen day wait for irrigation or domestic uses. Treat only portions of pond at one time.	Pennwalt
K-Lox	Hydrilla, algae.	Apply on sunny day for actively growing hydrilla.	Sandoz
Vegatrol LV 4-D	Watermilfoil, water lilies, coontail.	Not for irrigation ponds.	Velsicol Chemical Corp.
Weedtrine II	Selected submerged and emergent plants.	Not for irrigation ponds.	Applied Biochemists

Applied Biochemists, 5300 W. County Line Rd., Mequon, WI 53092. 1-800-558-5106.
Aquashade Inc., PO Box 198, Eldred, NY 12732. 914-557-8077.
Ciba Geigy Corp., PO Box 11422, Greensboro, NC 27409. 919-292-7100.
Great Lakes Biochemical, 6120 W. Douglas Ave., Milwaukee, WI 53218. 414-464-1200.
Ortho Div., Chevron, 575 Market St., San Francisco, CA 94105. 415-894-3760.
Pennwalt Corp., 1630 E. Shaw, Fresno, CA 93710. 209-226-8400.
Sandoz Inc., 480 Camino Del Rio, San Diego, CA 92108.
Thompson-Hayward, 5200 Speaker Rd., Kansas City, KS 66110.
Union Carbide, 7825 Bay Meadows Way, Jacksonville, FL 32216.
Velsicol Chemical Corp., 341 E. Ohio St., Chicago, IL 60611.

familiar with equipment. Screens, filters or aerators are installed in an attempt to solve problems. When chemicals are used, they are frequently of the wrong type. Biocides containing quaternary ammonium chloride compounds, chlorine, and copper sulfate are initially introduced due to their availability and the engineer's familiarity with them. Understandably, results are often poor. These chemicals are not specifically designed to control the plants present and they might not be compatible with the water quality in the pond.

It is important to note that there are specific aquatic herbicides and algaecides which are registered with the Federal Environmental Protection Agency for use in ponds.

The combination of algaecides and herbicides applied as a tank mix have shown promise through enhanced effectiveness. Specific recommendations on tank mix uses are available from manufacturers.

Several considerations must go into planning and implementing an aquatic nuisance control program. Before purchasing and applying anything, it is first necessary to identify the problem plants. State natural resource agents, university biologists, or Soil Conservation Service agents can usually be called upon for this.

Water volume or surface area and depth must be determined to calculate the amount of material required. Generally, aquatic chemical application rates are given in terms of gallons or pounds per surface acre (43,560 square feet) or acre-foot (326,000 gallons). Sometimes, parts per million (ppm) recommendations are given. One ppm is equivalent to 2.73 pounds of material in one acre-foot of water.

Flow, evaporation, or dilution with make-up water can affect results if they are not compensated for in the application. It is necessary that sufficient contact time between toxic concentrations of the herbicide and target plants be maintained for several hours. Granular formulations

Continues on page 58

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DOW

Circle No. 115 on Reader Inquiry Card

POND BOTTOM LINER STRATEGY IS MORE THAN A COVERUP

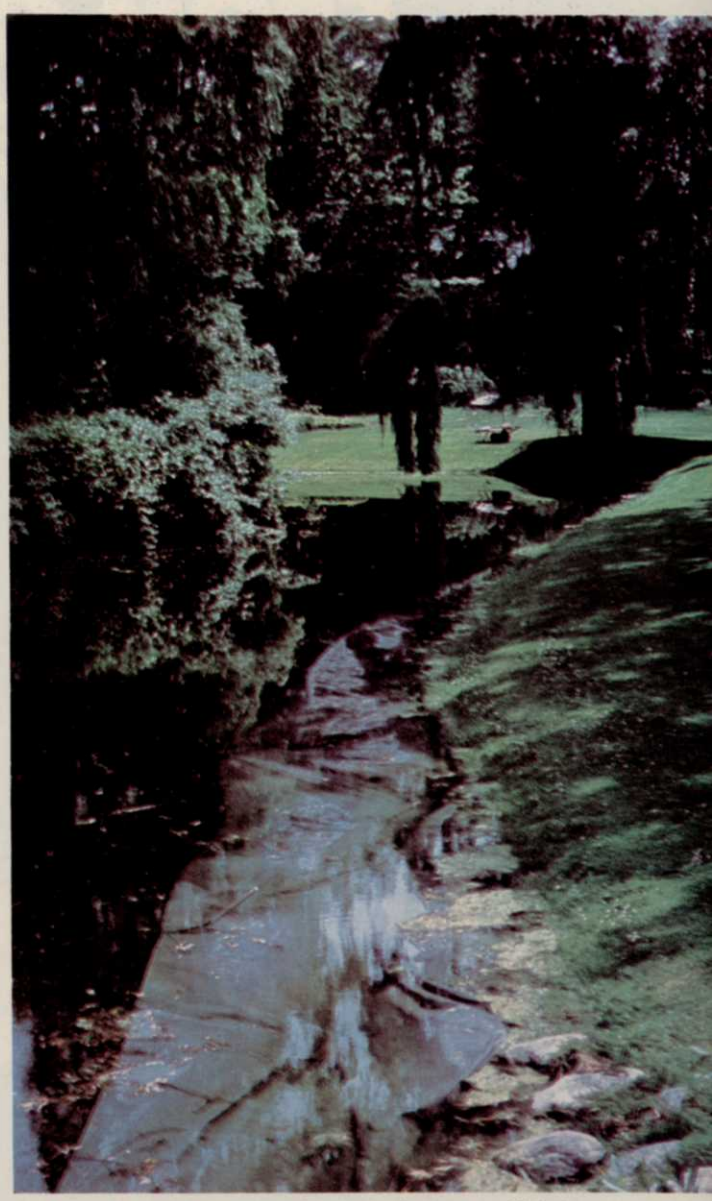
By **Douglas Pullman,** Aquatic Biologist, Dow Gardens, Midland, Michigan, and John Craig, Department of Fisheries and Wildlife, Michigan State University, East Lansing

Ornamental ponds are a common landscape feature of many midwestern arboretums, horticultural display gardens, golf courses, and housing subdivisions. These ponds are usually small, with areas less than 10 acres and depths rarely greater than 18 feet. The primary purpose of an ornamental pond is to enhance and highlight the beauty of the surrounding landscape. Occasionally, the ornamental pond is by itself an outstanding landscape feature. Secondary uses include fishing, swimming, and irrigation water supply.

Ornamental ponds are not merely holes in the ground that fill with water. To be an asset to a landscape, the ponds usually require intensive management efforts. Infestations of rooted and floating aquatic plants and blooms of various forms of algae have rendered many an ornamental pond a liability rather than an asset. The causes of excessive aquatic plant growth are surprisingly few. Excessive inputs of plant nutrients, inappropriate fish stocking, and the introduction of exotic plant species are the underlying causes for the decline of most ornamental ponds. Some aquatic systems management strategies deal directly with the underlying problems in ornamental ponds, but most are symptomatic cures. Management techniques used in ornamental pond management include watershed manipulations designed to limit nutrient inputs and sediment loading, deep dredging, piscicide applications, quarantining, harvesting, chemical herbicide applications, water dyes, bottom liners, flushing, water level control, raking, shallow dredging, drawdown, introduction and management of desirable plant and animal species.

Benthic semi-barriers are a recent addition to the arsenal of techniques used to control aquatic plant infestations. These barriers resemble large sheets of fiberglass windowscreen and are laid over the top of aquatic plant beds to control the plant growth beneath them. Perkins et. al. (1980) reported that a benthic semi-barrier, Aquascreen (manufactured by Menardi-Southern, Houston, Texas), was an effective control for Eurasian Watermilfoil *(Myriophyllum spicatum L.)* in Union Bay at the outlet of Lake Washington, Seattle, Washington. Mayer (1978) reported similar results for the control of various aquatic plant species in Lake Chautauqua, New York.

The pond located in the Dow Gardens, Midland, Michigan, is a 3.5-acre shallow water (mean depth less than four feet) ornamental pond. The primary function of the pond is one of aesthetics and secondary function is to supply irrigation water to the terrestrial gardens. Aquatic herbicides are rarely used in the pond because of its irrigation function. The pond system is infested with *Elodea canadensis* Michx. During the summer of 1979, Aquascreen was placed over a luxuriant bed of elodea. An attempt was made to fasten the screen to the pond bottom with stakes and brick weights, but these efforts were largely unsuccessful due to the



Aquascreen laid over vigorous Elodea in shallow pond failed to control by shading or compression. Elodea is moderately shade tolerant.

Continues on page 38

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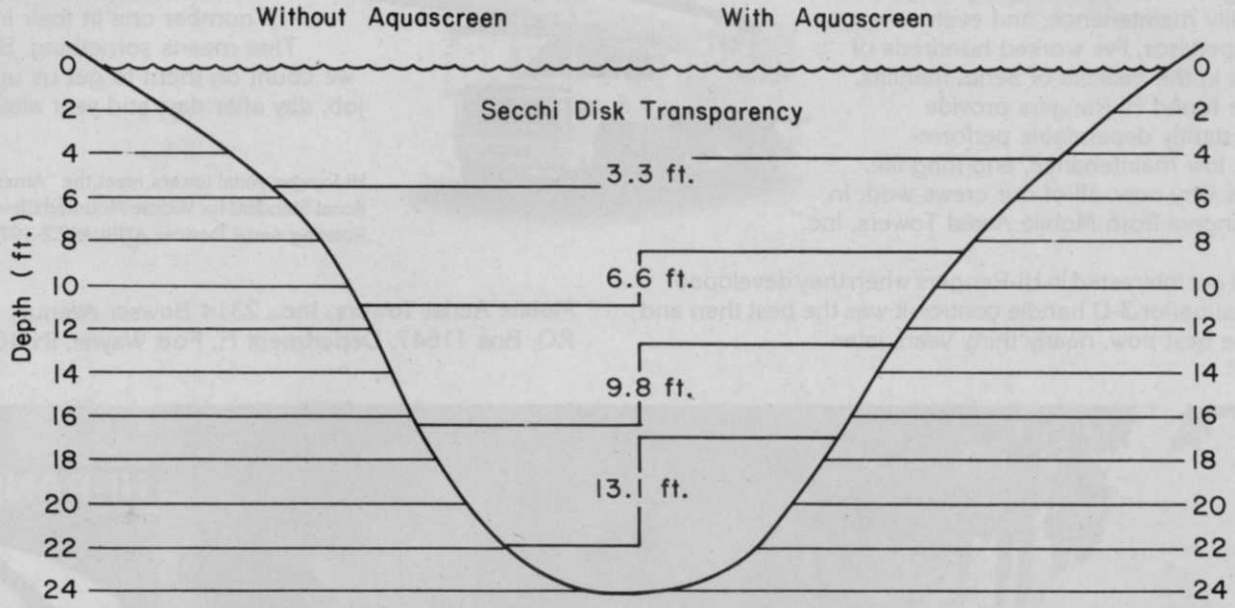
Coverup *from page 36*

dense and rigid structure of the plant community. Despite this problem, the Aquascreen was left in place to see if plant control would come about by shading out the elodea beneath the screen. The elodea, growing beneath the Aquascreen, did not decline in vigor, however. Complaints concerning the appearance of the test site led to the removal of the Aquascreen



Comparison of the maximum depths that *Elodea canadensis* can grow without being limited by too little light under natural conditions and under Aquascreen given four different Secchi disc transparancies.

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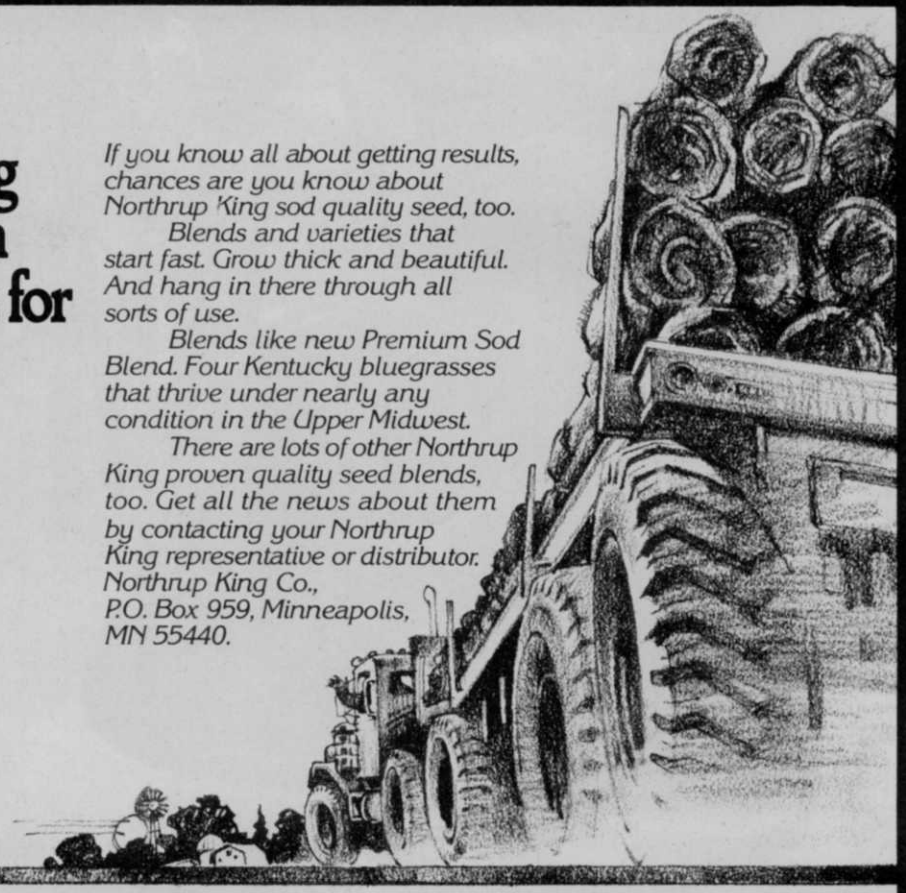

Circle No. 132 on Reader Inquiry Card

four weeks after it was applied. It appeared that the light attenuation was not great enough to control aquatic plant growth in shallow water.

Light Limitation

An investigation of the percent light attenuation caused by Aquascreen was conducted with a Li-Cor LI-188 Quantum/Radiometer/Photometer. Measurements were made in air and at various water depths. Our findings agreed with other researchers (Perkins et. al., 1979; Mayer, 1978) that Aquascreen attenuated light penetration by roughly 60%.

The depth to which light can penetrate through a column of water is a function of scattering and absorption by the water and dissolved and suspended substances in the water. A standard measure of transparency (depth of light penetration) in a pond or lake is made with a 7.9-inch (20 cm.) diameter white disc called a Secchi disc. These discs can be purchased from many scientific supply companies or can be easily constructed from a variety of common materials. A Secchi disc is lowered into the water on a line, cord, or chain to the depth where it just disappears as viewed from the water surface and then raised again to the depth where it reappears. The mean of these two depths is the Secchi disc transparency value for that pond or lake. The greater the depth where the disc finally disappears, the more transparent the water.

The maximum depth at which rooted, submersed plants can grow in typical ornamental ponds is determined by many factors but chief among these is water transparency. Secchi disc transparency roughly estimates a depth that is a certain fraction of the depth where light is so attenuated by absorption and scattering that it is not adequate to allow plant growth. This maximum depth varies from species to species, ranging from where 2% to 10% of the light that falls on the surface still remains. Like terrestrial plants, some aquatic plants are more shade tolerant than others. Elodea is a relatively shade tolerant species. Data suggest that it can grow where only 4.5% of surface light still remains (Hutchinson, 1975). Figure 1. shows graphically the maximum depth that elodea can grow, given different water transparencies with and without Aquascreen. Above the data lines light is sufficient for elodea to grow, but it would not grow at greater depths due to light limitation. It is obvious from this figure that Aquascreen does not shade

Continues on page 51

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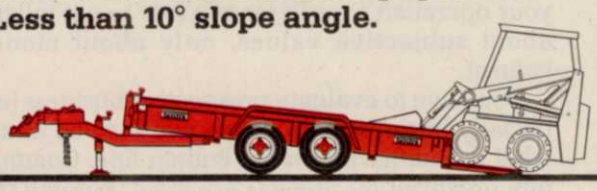

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REVIEW OLD BUSINESS IDEAS FOR USE IN TODAY'S MARKET

By Dave Johnstone, business columnist

It's hard to believe that only 22 or 23 years ago, the American Seed Trade Association's National Garden Bureau launched a community beautification campaign at North Tonawanda, New York, spearheaded by the local newspaper and involving local garden clubs, schools, school children, and just about every community element. At about the same time, Pontiac State Hospital in Michigan began to construct gardening programs for inmates which it termed "Horticultural Therapy" and city blocks in Philadelphia's blighted neighborhoods began to install window boxes. Most of these very promising efforts have run down, although an occasional garden club still dresses up a railroad station with petunias once a year, and various agencies of the federal government are plugging vegetable gardens as an inflation/poverty fighter in their news releases.

Polish Up Old Ideas For Local Application

Some of those concepts are still viable. Community relations aside, if you get the contract for cleaning up a creek and installing walkways or preparing vegetable garden beds, it's plus business. One general disadvantage to this type of thing: you usually have to take the time, effort and budget to sparkplug the program and see it through, as well as to provide for volunteer group labor, which is sometimes difficult to manage, and sometimes easy.

Be careful not to foreclose a new idea or approach before it's been tested. Example: There is a section of town adjoining a park and comprised of old mansions — not huge buildings but substantial homes. These homes are now all cut up, but because there has been a tradition of using outside grounds maintenance service in the neighborhood, this service has been continued. Two blocks away, the same conditions exist, except there has been no tradition of using outside grounds maintenance; yet, the homes are all cut up. There is now a strong reason to go that route; and even where the entire yard must be devoted to resident parking, there are possibilities for blacktopping, graveling, and even barrier planting of young trees to define property lines and improve appearance. These potentials are highly visible, but not to someone who says to himself, "There's never been any business in this neighborhood."

Rehabilitation is Probably Best Bet

Contrary to reports, new building and land development has not completely halted, although it is not especially brisk. In this economic climate, rehabilitation probably provides the best potential. Keep your eye open for properties, projects, and neighborhoods where rehabilitation and remodeling is contemplated. Conversion of old railroad stations, fire houses, school buildings, and warehouses into shopping strips, residences, and restaurants is still proceeding, and every such conversion should have a Green potential of some kind.

Dave Johnstone has more than 15 years experience in the construction equipment market. He has managed product introduction to the construction and rental equipment markets and has worked for a rental industry association. He has hands-on experience with nearly all types of outdoor equipment. If you have topics you would like Dave to address, you may write him at 267 Willow St., New Haven, CT 06511.

Rehabilitation of properties can make up for a slowdown in new building starts.

Where do you get your leads on these developments? From construction publications, of course (remember, you're as much a builder as any bricks-and-mortar trade), and bid advertising in the legal want-ads, but primarily from community involvement. Often, by the time projects are announced and bids are let, the details have been cast in concrete. Since they're called in at an early stage, architects are productive contacts. See if you can't become an associate member of your local or state contractors' organization as well as of the American Institute of Architects chapter.

There are two essentials you may find difficult to grasp: 1) as a going business, your operation has more elements in common with the building field than with arboriculture, horticulture, or agronomy from the standpoint of finances and market segments; and 2) the labor, equipment, materials you apply to a given task have their only economic importance as contributors to your operation's profit margin (we're not talking about subjective values, only about money values).

You have to evaluate prospective business (especially business with which you may be somewhat unfamiliar) from the bottom line. Community organization projects are great, but will the expense of supervising unsteady volunteer labor

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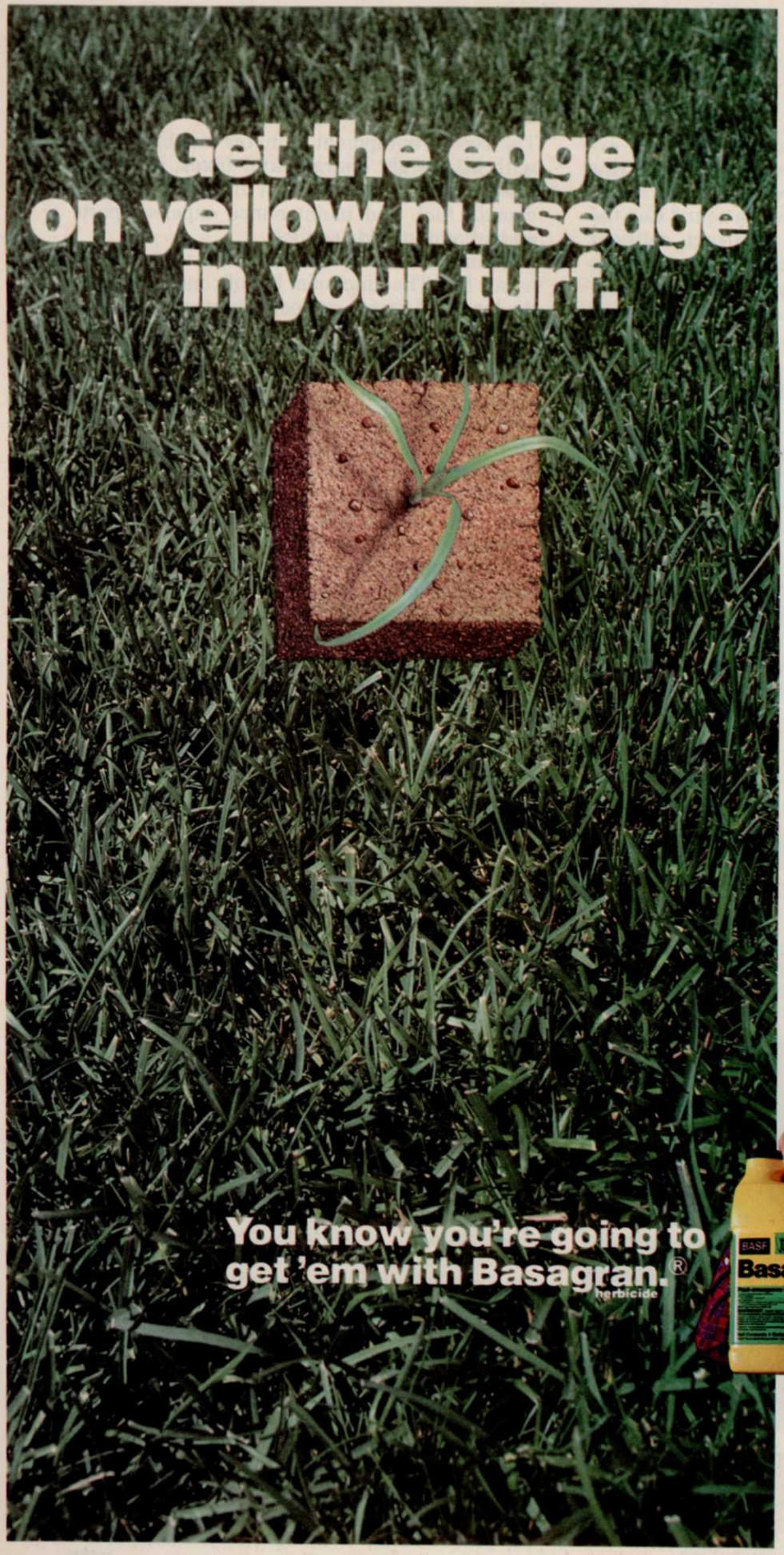

As a turf professional, you know how yellow nutsedge can compete with desirable grasses for water and nutrients. This tough weed reduces the attractiveness of residential turf, golf course fairways and tees. It can lower the value of sod crops as well. And you don't want to risk using a herbicide that might damage your turf. But you don't have to live with these problems.

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do you in? Are you free from an implied or explicit liability in directing volunteer labor? Has the sponsor given you an ironclad "hold harmless" contract that will hold up in court? Can the sponsor give you such a contract, without unlawfully waiving the inalienable rights to judgment of any injured people? Will you be able to keep the crowd at a safe distance from your equipment?

Quantifying All Costs is Difficult

In estimating and costing, a computer can be invaluable. Ideally, each step of a job should be costed out from the standpoint of labor, equipment, live and inert materials, and proportion of general overhead that can be assigned to it. The cost of labor includes recruitment, fringe benefits, and overhead required to manage it.

> Equipment has two lives, a functional life and an economic life.

The cost of equipment includes purchase price with all freight charges and taxes, or rental charge, and depreciation if the equipment is owned, fuel, and maintenance expense (parts and labor or outside service).

Equipment has a functional life and an economic life. The functional life of course refers to the length of time it can perform work. The economic life refers to the length of time it makes a positive contribution to profit. We would modify the definition of economic life a bit to accommodate technological obsolescence. Incorporation of a new feature or accessory can multiply profitability to the point where existing equipment, while still making a contribution to profit, cannot be considered adequate. Economic life, then, is the length of time equipment makes the greatest possible contribution to profit.

Your computer should be programmed to evaluate both people and machines as individual contributors to profit. You need not act on the evaluations, but you should have them at your fingertips. They can be computed quite easily by subtracting all associated costs from gross income generated, but you have to log correctly all costs. Unless you're an accountant, this kind of close and careful record-keeping may be a big fat headache. One of the great difficulties of installing a computer is that it imposes detailed accountability, which free spirits sometimes find hard to swallow.

Pinpointing Profit Contribution of Equipment

As far as equipment is concerned, you first tally its cost by adding purchase price, delivery charges, taxes, finance cost, insurance, and licenses (or, alternatively, rental/leasing cost). Then you attempt to estimate economic life (not functional life), disposal value (if any), and replacement cost, remembering to factor in inflation, which can be as high as 20%-25% on machinery. The procedure is something like this: Equipment Cost plus Estimated Service Cost less Disposal Value plus Replacement Cost; divide result by Economic Life in years to get rough Running Cost; add cost of Operator, Fuel, and Transportation to Job Sites to smoothe Running Cost. Set up an Equipment Utilization report on your computer to relate Sales Volume generated by the individual machine to its Running Cost and to your Overall Volume and Profit. Detail number of hours used and number of hours available. Both statistics are important: If a machine is down most of the time but generates a large volume when it does work, it may be profitable, common sense to the contrary. All this information can very probably be placed on an Individual Machine Record and extracted for the Equipment Utilization report. But don't attempt such record-keeping without a computer.

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VEGETATION MANAGEMENT

By Roger Funk, Ph.D., Davey Tree Expert Co., Kent, Ohio

Q: *Is it possible for a girdled tree to live and continue growing? A client has a large walnut tree that was girdled by vandals last year and, although we expected it to die, the tree has begun leafing out normally this spring. Is there anything we can do to help save the tree? (California)*

A: If a strip of bark is removed completely around the trunk, the tree will die.

Sugars produced in the leaves are translocated downward to the roots in the inner bark (phloem). The root cells add mineral elements absorbed from the soil solution to these sugars to produce other compounds required for growth and development. When the supply of sugar is interrupted by girdling, the available sugar and stored carbohydrates are gradually depleted and the roots die.

The tree may die the same year it is girdled, but there are many reported cases of girdled trees continuing to grow for two years and then failing to leaf out the third year.

You could try grafting to bridge the girdled section of the trunk, or a technique called INARCHING, where established seedlings or suckers near the base of the trunk are decapitated and the sharpened tip inserted under the bark above the girdled area. Both practices should be done when the buds begin to swell in the spring. If you are unfamiliar with the techniques, contact a local plant propagator, or contact me at our headquarters in Kent, Ohio.

Q: *When is the best time to transplant dogwoods? (Tennessee)*

A: I have been told that some nurserymen prefer to transplant dogwood during the bloom period, but I have not seen any research to substantiate this practice. According to the literature, the best time is while the trees are dormant, preferably from February through March in your area.

There is a greater chance for survival if dogwoods are root pruned one year before transplanting.

Q: *How can rabbits be kept out of a garden? I have tried everything, including fences which they simply dig under. (Pennsylvania)*

A: Put up 36″ width chicken wire and bend the bottom and top 6″ outward. These "fenders" will prevent rabbits from digging under or hopping over the fence. I am told it also works for raccoons.

Q: *What herbicide can I use to get rid of pigweed in beds of alyssum and dianthus? Everything I have tried injured the bedding plants.*

A: The pre-emergent herbicide, Treflan (Trifluralin), will control pigweed and is safe on the two perennials you mentioned. It should be incorporated into the soil about two to three inches.

Q: *Recently I attended a symposium on the Mauget Tree Injection System. Is this a widely accepted mode of tree fertilization and pesticide application in the landscape industry? How effective, convenient and expensive (other than the initial cost of the kit) is it on a long-range basis? (Pennsylvania)*

A: Several tree care companies are using Mauget capsules, but our research department has not been sufficiently satisfied with the results to recommend the Mauget method to our field personnel.

We have tested various injection systems to determine the apparent injury to the trunk and the rate of uptake, distribution and effectiveness of the chemicals injected. Although response varied with the species, age and condition of the trees as well as the environmental conditions and nature of the chemical, the results summarized below were fairly consistent throughout the tests.

1) When no chemical was added, Mauget injectors resulted in minimal wood and cambial dieback compared to larger injectors.

2) Many injected chemicals caused columns of discolored wood and cambial dieback regardless of the injection technique.

3) The rate of chemical uptake through injectors seated in drilled holes was at least 10 times faster than through a Mauget insertion tube of the same diameter.

4) Distribution and uptake was greatly enhanced by an injection pressure of 40 psi compared to a gravity system or the low pressure in the Mauget method.

5) Trunk injections have not been effective for trunk or stem-infesting insects such as borers and scale.

We are continuing our research to evaluate trunk injections for diseases and leaf-feeding insects. At the present time our policy is to trunk-inject only if other corrective procedures such as spraying or soil fertilization is either not effective nor practical under existing conditions.

Q: *Is it OK to hydroseed crownvetch? (Maryland)*

A: Hydroseeding has become a common method of establishing crownvetch on slopes. The normal procedure is to apply limestone, fertilizer, seed (crownvetch and companion grass), inoculant and cellulose pulp followed immediately by an application of mulch.

Q: *Could you tell me where the American Rose Society is headquartered?*

A: American Rose Society, P. O. Box 30,000, Shreveport, Louisiana 71130.

The following question, which appeared in this column last October, has caused some confusion because of our error in labeling the two types of bentgrass. Here is the corrected version.

Q: *What is the best way my men can tell nimblewill from bentgrass in clients' lawns?*

A: Both nimblewill and the bentgrasses have a membraneous ligule. However, the ligule for nimblewill is short and jagged. Also, nimblewill has long hairs at the edges of the collar.

Send your questions or comments to: Vegetation Management c/o WEEDS TREES & TURF, 757 Third Avenue, New York, NY 10017. Leave at least two months for Roger Funk's response in this column.

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Circle No. 139 on Reader Inquiry Card

SOD PRODUCER NEWS

Chocolate Town readies itself for sod producers

The recently built Hershey Motor Lodge & Convention Center will host members of the American Sod Producers Association for their summer convention and field days, July 15-17.

The location, near many sod growers, farmers, and family entertainment spots, should attract a large number of members and exhibitors, says ASPA's Executive Director Bob Garey. Gettysburg and other historic sites are short drives from Hershey.

Rich Morrison, general chairman and member of the Pennsylvania Sod Producers Association, is planning a comprehensive convention schedule. Exhibits open on Wednesday (the 15th) afternoon at the convention center. There will also be a golf tournament and tennis and recreation time the first day.

The exhibits reopen at 7 a.m. Thursday and a continental breakfast will be served in conjunction with them. The annual business session begins at 10 with an address from Penny Hallwell, secretary of agriculture for the Commonwealth of Pennsylvania. A review of ASPA activities and election of officers follows.

After lunch, attendees will travel to Davis Nurseries, run by Paul Davis, for two types of demonstrations: sludge injection and utilization and irrigation equipment. An embryo transfer facility, which uses new technology for breeding cattle, exists at the nursery and is available for a possible tour. Buses will take those who skip the facility immediately to Landis Valley Farm Museum, which features historical agricultural and farm implements.

At night, a Pennsylvania Dutch celebration will occur with a reception and dinner in front of the lake by the lodge.

Friday begins with a buffet breakfast. Buses will then take attendees to the Sporting Valley Turf operation of Bob Hummer. The field demonstrations will be held there.

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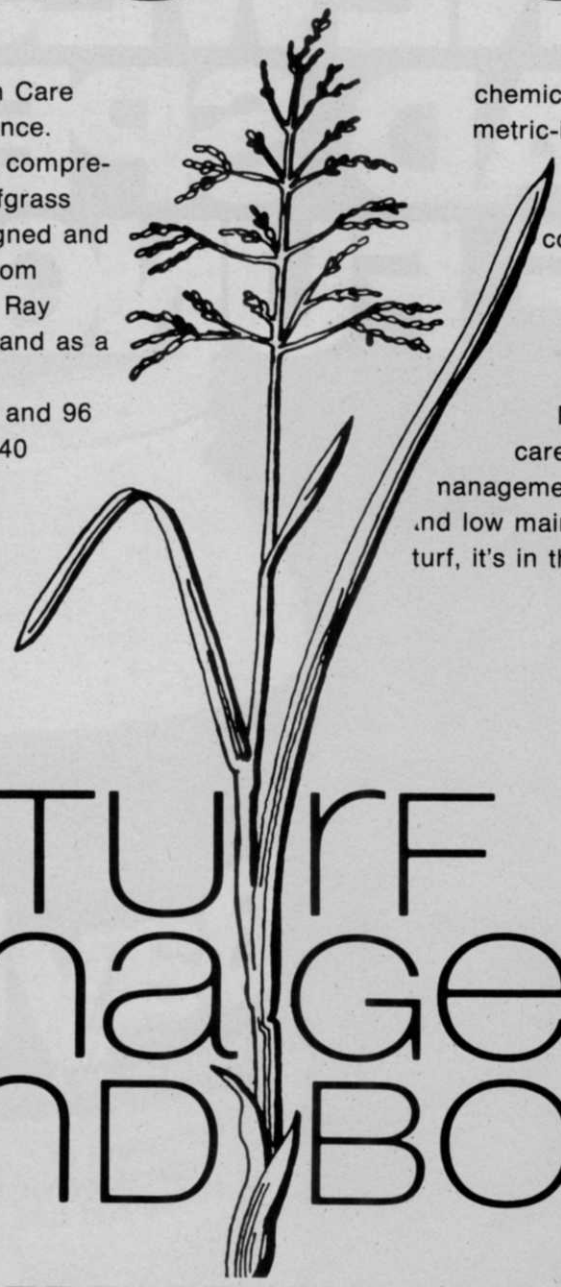
The book contains 150 illustrations and 96 color photographs. Data includes 240 tables and forms. Included are specifications for rootzones, employment, calculations for chemical applications, and extensive metric-imperial conversion. Business and technical aspects of turfgrass management are covered in this 424-page book. Planning, purchasing, hiring, construction, and plant selection are put together for easy on-the-job reference. Markets covered include lawn care, sod production, golf course management, cemeteries, athletic fields, and low maintenance areas. If it concerns turf, it's in the Turf Managers' Handbook.



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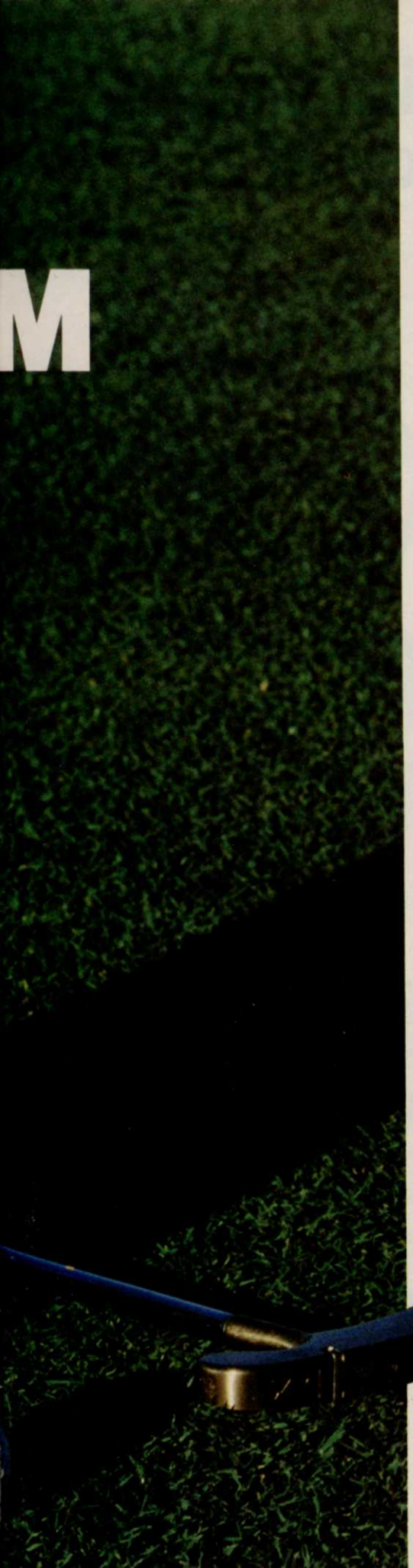

®BAYLETON. Superior control of Fusarium blight. Preventive and curative action for many other turf diseases.

BAYLETON 25% wettable powder fungicide is an exciting new fungicide that has been thoroughly tested and is highly recommended by university extension personnel. Its broad spectrum activity gives the turf care professional a valuable tool to battle costly and unsightly fungus diseases. And its proven superior control of Fusarium blight makes BAYLETON even more valuable when this disease is a problem.

BAYLETON controls the following turf diseases:

- Fusarium blight
- Brown patch
- Dollar spots
- Snowmolds
- Red thread
- Stripe smut
- Certain rusts

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Good residual activity means long-lasting control. That means fewer applications throughout the year.

Systemic action means control that moves quickly and evenly through turf grass for uniform disease control.

BAYLETON comes in 2-pound plastic containers that are convenient to use and to store.

BAYLETON is a product of the Agricultural Chemicals Division of Mobay Chemical Corporation. One of America's leading manufacturers of herbicides, fungicides and insecticides.

Also available for turf care from Mobay: ®SENCOR herbicide for broad spectrum weed control in established Bermuda grass turf*.

®NEMACUR nematicide for unmatched nematode control. And DYRENE foliage fungicide for effective disease control.

NEMACUR 3 is a RESTRICTED USE PESTICIDE.

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Agricultural Chemicals Division
Box 4913, Kansas City, MO 64120

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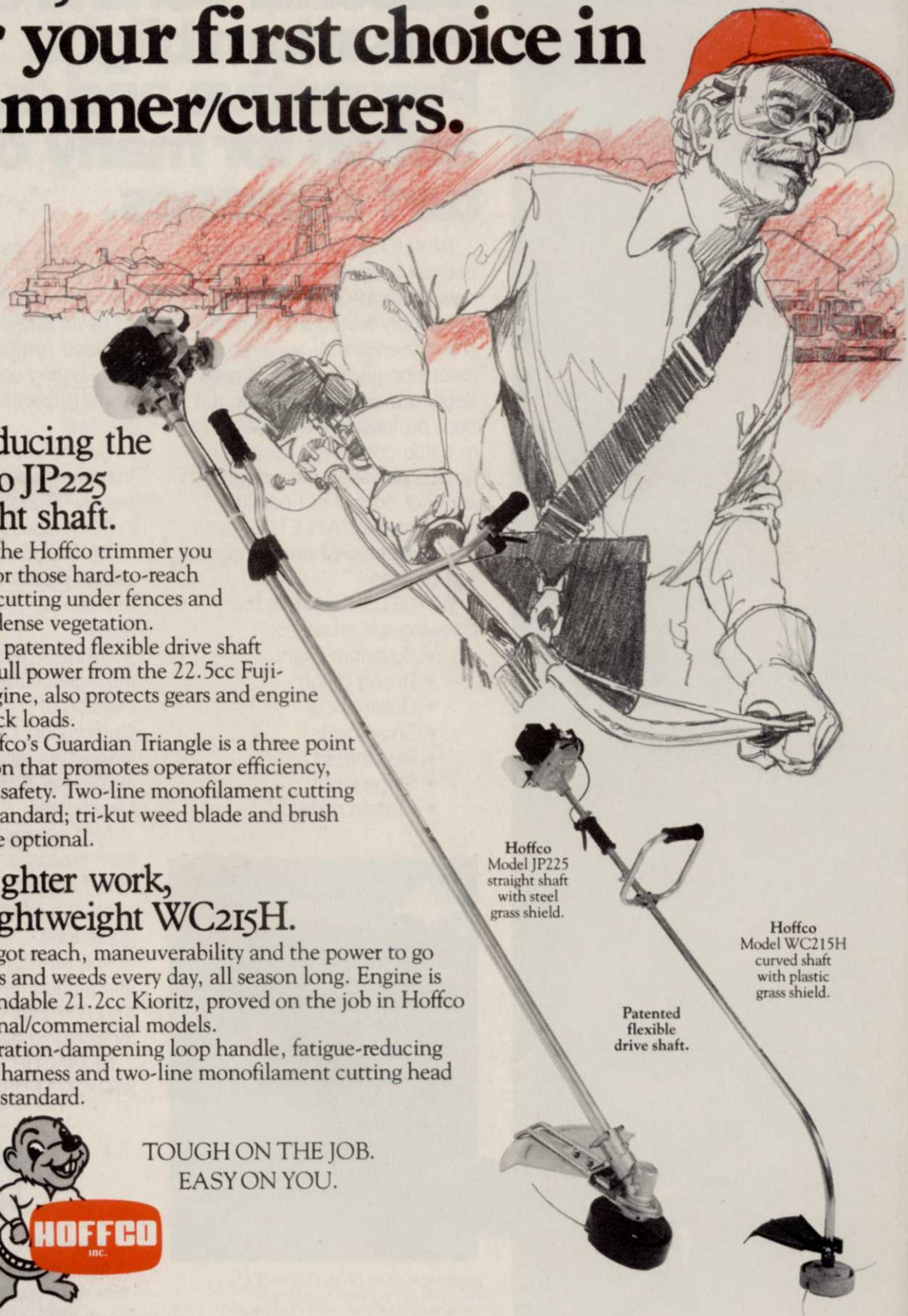
Now, a second choice in shafts for your first choice in trimmer/cutters.



Introducing the Hoffco JP225 straight shaft.

It's the Hoffco trimmer you wanted for those hard-to-reach jobs like cutting under fences and pruning dense vegetation.

Our patented flexible drive shaft delivers full power from the 22.5cc Fujirobin engine, also protects gears and engine from shock loads.

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It's got reach, maneuverability and the power to go after grass and weeds every day, all season long. Engine is the dependable 21.2cc Kioritz, proved on the job in Hoffco professional/commercial models.

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HEAVY DUTY

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Circle No. 121 on Reader Inquiry Card

Coverup *from page 39*

elodea adequately in shallow waters to make it a viable control mechanism if light attenuation were its only mode of control.

Compression and Space Limitation

It appears that the principal mode of aquatic plant control affected by Aquascreen is compression and space limitation. It would also appear to be impractical to attempt this sort of control for a dense, rigid, and compact mature stand of elodea. Aquascreen does, however, show promise as a preventative or re-infestation control of elodea in an area that has been previously cleared of vegetation by raking, cutting, shallow dredging, or herbicide application. This was tested in the Dow Gardens pond system during the summer of 1980.

On May 7, 1980, four 5x5-foot sheets of Aquascreen were placed randomly in a shallow water area that had just been raked free of vegetation. Two 5x5-foot plots were chosen as controls. All the vegetation from the six plots was harvested on August 8, 1980 and ash-free dry weights were determined for subsamples.

Elodea grew beneath the Aquascreen and appeared to be vigorous but did not displace the screens upward in an unsightly fashion. Aquascreen was indeed quite effective in controlling the growth of elodea when applied in this manner. The plant biomass growing beneath and through Aquascreen was only 3% of that found in the control plots measured as ash-free dry weight per square foot.

Elodea growing adjacent to the treatment plots tended to overgrow the edges of the screens, but none of the treatment plots were completely covered by the encroaching plants. This year we will treat a much larger area with Aquascreen to evaluate the extent of adjacent plant encroachment over the treatment area and its impact on the efficacy of Aquascreen as an aquatic plant control tactic.

Aquascreen appears to have a great potential for the control of rooted, submersed aquatic plants in shallow ornamental ponds, as long as good pond bottom contact is made. Luxuriant, rigid, and dense plant communities, such as those formed by elodea, may have to be removed mechanically or with herbicides prior to the application of Aquascreen so that proper bottom contact can be made. Bottom contact is also essential so that the treatment will not be aesthetically objectionable. Although the light attenuation effect caused by Aquascreen is not adequate to be a viable control strategy in typical shallow ornamental ponds, the compression and space limitation effects caused by Aquascreen integrate well into ornamental pond management planning and technology.

the "Piggyback" Will!

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Princeton's mighty "Piggyback" is the perfect low cost, heavy-duty material handler for all your industrial or agricultural needs. It gets its name from the way it rides suspended behind your truck to and from the job...never needing a trailer or taking up valuable load space. The "Piggyback" is light... strong...fast...durable... and completely stable on the job!

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- Will lift and load up to 4500 lbs....yet weighs only 3500 lbs.
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- Strong and safe, operating on steep grades.
- Powerful, but economical diesel engine provides superior power for all adverse operating conditions. (30-50 hp available.)

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EVENTS

The current issue of WEEDS TREES & TURF carries meeting dates beginning with the following month. To insure that your event is included, please forward it, 90 days in advance, to: WEEDS TREES & TURF Events, 757 Third Ave., New York, NY 10017.

Virginia Nurserymen's Association and the Virginia Society of Landscape Designers joint summer meeting, Ingleside Red Carpet Inn, Staunton, VA, **June 21-23.** Contact Katherine Martin, Executive Director, VNA, P.O. Box 827, Richmond, VA 23207, 804/644-0912.

American Seed Trade Association annual meeting, Atlanta, GA, **June 28-July 2.** Contact ASTA, Executive Building, Suite 964, 1030 15th St. N.W., Washington, DC 20005.

Northern Michigan Turf Managers Association meeting, Cadillac, MI, **July 7.** Contact C. E. "Tuck" Tate, President, NMTMA, 1147 Santo, Traverse City, MI 49684, 616/947-9274.

New York State Nurseryman's Association Convention and Trade Show, Onondaga County War Memorial Convention Center, Syracuse, NY, **July 7-10.** Contact Margaret Herbst, 230 Park Ave., New York, NY 10017, 212/685-4579.

Aquatic Plant Management Society annual meeting, Coliseum Ramada Inn, Jackson, MS, **July 12-15.** Contact Lou Guerra, Texas Parks & Wildlife Dept., 134 Braniff, San Antonio, TX 78216, 512/349-2174.

Grower's Seminar, San Jose, CA, **July 14.** Contact Lanny E. Walker, Public Relations Director, California Association of Nurserymen, 1419 21st Street, Sacramento, CA 95814, 916/448-2881.

American Sod Producers Association Summer Convention & Field Days, Hershey Motor Lodge & Convention Center, Hershey, PA, **July 15-17.** Contact ASPA, Bob Garey, Executive Director 9th & Minnesota, Hastings, NE 68901, 402/463-4683.

American Association of Nurserymen 106th Annual Convention and Trade Show, Stouffer's Cincinnati Towers, **July 18-22.** Contact AAN, 230 Southern Bldg., Washington, D.C., 20005.

Society of American Florists 1981 convention, Denver Hilton, Denver, CO, **July 29-Aug. 1.** Contact Barbara Kratchman, Society of American Florists, 901 North Washington Street, Alexandria, VA 22314, 703/836-8700.

American Phytopathological Society Annual Meeting, New Orleans, **Aug. 2-6.** Contact Steven Nelson, Convention Services, APS, 3340 Pilot Knob Rd., St. Paul, MN 55121, (612) 454-7250.

Sixth Nebraska Turfgrass Field Day and Equipment Show, Aug. 4. Contact Dr. Robert Shearman, University

Continues on page 54

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8 pages of helpful information to help you select and use your pumps better. Hookup diagrams for piston, roller and centrifugal pumps. Graphs of pump outputs, flow through spray nozzles. Data on pump and sprayer component selection plus much more. Send for your free copy now.

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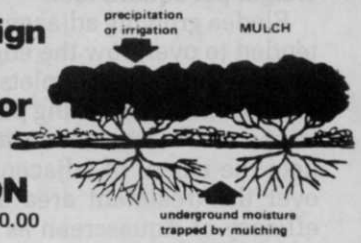

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The first full-length book dealing with this subject. Covers various strategies for conserving water in the landscape such as selecting plants which require less water, altered cultivation practices, expanded use of mulches, reusing water and altering irrigation practices. The subjects covered in this book include:

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for over 20 years.
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In more than two decades of commercial usage, Pennwalt aquatic herbicides have shown their effectiveness and compatibility with the environment, especially the ecological support systems of lakes, ponds, and streams.
Pennwalt aquatic herbicides kill water weeds and algae on contact*. And because these herbicides are based on a non-persistent compound—endothall—there is no bioaccumulation in the aquatic environment. Endothall breaks down in two weeks or less into carbohydrates—common constituents of plant life.
Pennwalt's Aquathol® K features a margin of safety to fish when properly applied, with little adverse effect on fish food organisms or the general ecosystem. Swimming can be permitted just 24 hours after treatment with Aquathol K or Aquathol Granular.
To fill all your needs, Pennwalt aquatic herbicides come in a variety of forms: ■ AQUATHOL® K Herbicide—in convenient liquid and granular forms. ■ HYDROTHOL® Herbicide/Algicide—in liquid and granular forms. ■ HYDOUT™ Herbicide/Algicide** —pellet form.
Clean up your customers' water weed problems with the products that are backed by years of experience—Pennwalt aquatic herbicides.
Interested in serving the aquatics business as an applicator? Let us help you with complete educational and technical support. Write or call for further information: Pennwalt Corporation, Three Parkway, Philadelphia, PA 19102. (215) 587-7000.
*Consult the label for species controlled and rates required.
**"HYDOUT" is available as a Special Local Needs registration in Florida, Alabama, Texas and Georgia.
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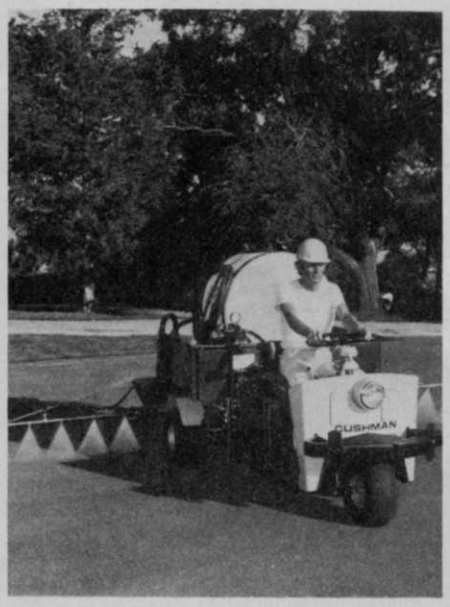
CHEMICALS ■ EQUIPMENT
HEALTH PRODUCTS

Banvel® + 2,4-D = Turf (minus 29 of the toughest kinds of weeds)



All it takes is one application, and your weed control job is done for the season. And so are 29 of the hardest-to-kill varieties of broadleafs.

BANVEL plus 2, 4-D is a versatile combination you use anytime from early spring to late fall. It kills by penetrating both leaves and roots, so weeds can't come back.

Mixes quickly, stores well. Use it according to directions, and your weed worries are over for the year.

Ask your Velsicol distributor about BANVEL 4S, too. Or write Velsicol Chemical Corporation, 341 E. Ohio Street, Chicago, IL 60611.

Before using any pesticide, read the label.

Velsicol

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Events *from page 52*

of Nebraska, 377 Plant Science Bldg., Lincoln, NE 68583, 402/472-2550.

Turf Field Day, University of Missouri South Farms, **Aug. 4.** Contact John Dunn, Horticulture Dept., University of Missouri, Columbia, MO 65211, 314/882-7838.

Illinois Landscape Contractors Association Summer Field Day, D. Hill Nurseries, Union, Illinois, **Aug. 5.** Contact Lucille Little, 202 W. Main St., PO Box 1049, St. Charles, IL 60174, (312) 584-5770.

International Society of Arboriculture Convention, Boyne Mountain Resort, Boyne Falls, Michigan, **Aug. 9-12.** Contact E.C. Bundy, ISA, PO Box 71, 5 Lincoln Square, Urbana, IL 61801, (217) 328-2032.

Central Plains Turf Foundation/ Kansas State University Turf Field Day, Manhattan, KS, **Aug. 12.** Contact Dr. Robert Carrow, Kansas State University, Dept. of Horticulture, Waters Hall, Manhattan, KS 66506, 913/532-6170.

International Garden Centre Congress, Disneyland Hotel, Anaheim, CA, **Aug. 24-30.** Contact Pat Redding, GCA, 230 Southern Bldg., Washington, DC 20005.

Grower's Tour, Aug. 25. Contact Richard Staples, Program Administrator, California Association of Nurserymen, 1419 21st Street, Sacramento, CA 95814, 916/448-2881.

University of Rhode Island Turfgrass Field Day, Kingston, RI, **Aug. 26.** Contact C.R. Skogley, University of Rhode Island, Dept. of Plant Science, Woodward Hall, Kingston, RI, 02881, 401/792-2570.

Northern Michigan Turf Managers Association meeting, Gaylord, MI, **Aug. 26.** Contact C. E. "Tuck" Tate, President, NMTMA, 1147 Santo, Traverse City, MI 49684, 616/947-9274.

Ornamentals Northwest Seminars, Oregon State University, Portland Memorial Coliseum Portland, OR, **Aug. 28-29.** Contact Dr. James L. Green, Oregon State University, Dept. of Horticulture, Corvallis, Oregon 97331, 503/754-3464.

Garden Industry of America Conference & Trade Show, Pittsburgh Convention/Exposition Center, Pittsburgh, PA, **Sept. 10-12.** Contact GIA, Box 1092, Minneapolis, MN 55440.

Embark® Plant Growth Regulator Distributor Locations

California
Moyer Chemical Co.
San Jose
Santa Ana
Target Chemical Co.
Cerritos
Fresno
San Jose
Van Waters and Rogers
San Jose
Los Angeles
San Diego
Wilbur-Ellis Co.
Chula Vista
Santa Fe Springs
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Colorado
Balcom Chemical Inc.
Greeley

Florida
Southern Agricultural Insecticides, Inc.
Palmetto

Georgia
Regal-Chemical Co.
Alpharetta

Illinois
Chicago Toro
Drake-Scruggs Equip. Inc.
Decatur
Turf Products, Ltd.
West Chicago

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The Daltons Inc.
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Big Bear Equipment
Des Moines
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Kansas
Champion Turf Equipment
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George W. Hill & Co.
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Maryland
Commercial Lawn Services Inc.
Rockville
Cornell Chemical & Equip.
Linthicum Heights

Massachusetts
Richey and Clapper Co.
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Michigan
Lawn Equipment Corp.
Novi
W. F. Miller Co.
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Minnesota
Minnesota Toro
Minneapolis
Turf Supply Co.
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Omaha

New Jersey
Andrew Wilson Inc.
Mountainside

New York
Agway Inc.
Syracuse
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Yonkers
J & L Adikes
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AT HOLY CROSS, FULL-TIME TRIMMING IS BECOMING A PART-TIME JOB.

Larry Farrell
Superintendent
Holy Cross Cemetery
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Maybe you can't see the difference. But since Holy Cross Cemetery added EMBARK plant growth regulator to its seasonal work force, they're doing 50 percent less trimming.

What started as a test is now a full fledged turf maintenance tool for Larry Farrell, superintendent of this 160-acre cemetery.

"By spraying EMBARK PGR on fast-growing grass around raised monuments, crews only trim 4 or 5 times a season," says Larry. "That's down from the usual 8 or 10 trips."

For Holy Cross a 50 percent drop in trimming means better use of part-time labor. Because if crews aren't cutting around markers, they're busy mowing or doing other cemetery maintenance jobs.

With EMBARK PGR, you spray whenever grass is actively growing. Spring, summer or fall.

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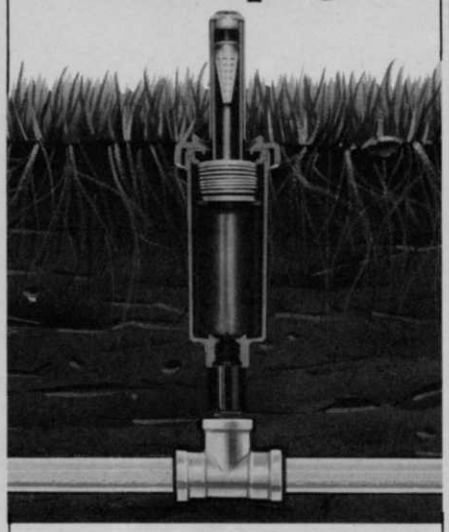
Underneath it all... Weather-matic®, the hidden secret of beautiful landscaping.



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WT&T

LETTERS

Address for Standards

On page 14 of the January 1981/Vol. 20, No. 1 issue, under *Equipment* is an article about a publication on chain saw safety. This is available from the American National Standards Institute, and the publication number (B175.1-1979) is listed.

Unfortunately, no address is given for American National Standards Institute, and I would like to order this publication. Would you please send me more information so that I may order this?

Sincerely,
Grace Jacobson, Secretary
Minnesota Department of Agriculture

The address is: American National Standards Institute, Inc., Sales Dept., 1430 Broadway, New York, NY 10018. The institute has also just published its 1981 Catalog of American National Standards. This 206-page publication may be obtained at $8.50 per copy.

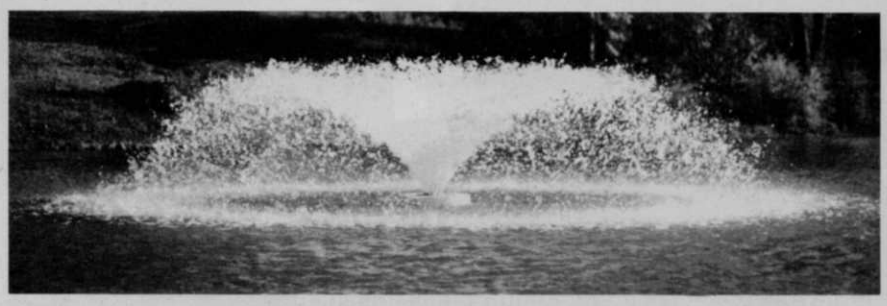
Landscape book available

I was pleased to note that you gave the serialization of Chapter 2 from "Landscape Design That Saves Energy" prominent placement (February WTT). However, I noticed one problem that I hope you may correct in a subsequent issue. Nowhere in the article or in your editorial is the name of the book mentioned. This may make it difficult for your readers who wish to buy the book, especially since there is a typographical error in the publisher's address as well (William Morrow and Co. is at 105 Madison Avenue).

Also, on page 21, line 37, there is another typo that conveys an incorrect fact. A windbreak of 20 foot (not two foot) Austrian pine cuts a 12 mph wind velocity to 3 mph.

Despite these slips, Marc Schiler and I are pleased with the product. I hope your readers are, as well.

Sincerely,
Anne Simon Moffat



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These self-contained water quality improvement systems help you keep unsightly algal growth and objectionable odors under control naturally, without costly chemicals.

And their sparkling spray displays may dramatically change the natural beauty of your ponds and lakes.

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Renovation in progress.

Now you can renovate your fairways in days—while your golfers keep playing.

Just apply Roundup® herbicide to your weed infested fairways. While Roundup goes to work, golfers can keep playing right over the treated turf. And you can reseed right through the dying grass just 7 days after applying Roundup. Re-infestation from weed roots won't be a problem either, since Roundup effectively controls the root systems of treated weeds and grasses. Yet Roundup is inactive in the soil, and won't move out of the treated area to injure desirable vegetation. You can even use Roundup to control weeds around greens, for general cleanup, in and around sandtraps, along fence lines, even around the clubhouse and tennis courts.

See your chemical dealer soon for your supply of Roundup. It can make fairway renovation and golf course weed control fast and efficient for you, and leave a lot more playing time for your golfers.

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Circle No. 130 on Reader Inquiry Card

or metering (drip) systems are sometimes used in flowing water situations or to treat make-up water which is entering the pond. Recirculating pumps can sometimes be shut down during treatment and kept off for several hours. Ponds fed by significant amounts of runoff should not be treated when heavy rains threaten.

While most aquatic pesticides are compatible with a wide range of water qualities, certain conditions can neutralize them. Some herbicides should not be used in muddy waters since the active ingredient becomes deactivated (i.e. Diquat). Similarly, copper sulfate applied for algae control in hard water precipitates out of solution too quickly to be effective. Chelated copper may be used to insure proper contact time.

Corrosion can be of some concern, particularly when the pond water is recirculated through or around expensive equipment. Generally, chemical concentrations after application are too low to cause any problems. High dosage of copper sulfate or poor distribution of products, however, could cause damage.

Effluent standards, particularly in sewage treatment or retention ponds, must be met if they flow into nearby waterways. Familiarity with state guidelines and permits is of utmost importance. For example, the suspended solids content might exceed state requirements due to abundance of planktonic algae. A remedial action would be to apply a copper algaecide. It must be insured, however, that the copper concentration does not exceed effluent standards for copper.

Equipment used for applying aquatic pesticides will vary depending upon the size of the area to be treated and the formulation being used. Granular materials are often spread with a hand scoop or mechanical spreader. Power sprayers with 1 to 5-hp engines are useful in areas exceeding one acre. Hand or backpack orchard sprayers facilitate treatment of small water bodies. Metering in of chemical with drip systems is effective where compensation for water flow or exchange must be considered.

Frequency of chemical application will vary with each situation. In temperate climates, a single herbicide treatment followed by two or three algaecide applications will keep vegetation under control during the warmer months. In warmer regions, more frequent applications might be necessary. Chemicals are best applied before growth gets out of hand and when water temperatures are above 60°F. Periodic examination of the pond will help in developing the proper maintenance schedule.

Regardless of the product being used, the applicator should familiarize himself with the label to insure proper handling, application, and dosage of the material. Knowledge of applicable state laws, permits, and licensing should be obtained and complied with as well. **WTT**

Hopkins

NEW REVENGE™

cost effective control of

Johnsongrass, Bermuda, other grasses

1. **Quick brownout.** Kills entire plant—roots and all. One application for season-long control.
2. **Economical, easy to use.** Free-flowing. Completely water soluble, forms a true solution.
3. **Up to 98% control** of rhizome Johnsongrass into the next season—even where foliar materials alone fail to give good control.

REVENGE is a highly effective, low-cost herbicide for control of established annual and perennial grasses. It combines contact action with systemic action that moves chemicals through foliage *and roots.*

REVENGE used at 15 pounds per 100 gallons of water, along with 2 quarts of Hopkins' Neptune® or Agicide® Activator, gives fast, effective control of troublesome perennial grasses such as quackgrass, Bermudagrass, Johnsongrass and cattails. Don't just get mad at grass problems — get REVENGE.

For nearest distributor, contact:

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H-R-50

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PRODUCTS

The 27-horsepower diesel-powered Turf Blazer 727 has a 72-inch cutting head located in an out front offset deck. From Howard Price Turf Equipment,

the Turf Blazer 727 has a pedal-controlled hydrostatic transmission that provides speed variation from 0-10 mph forward and 0-5 mph reverse. It can mow 3.7 acres per hour.

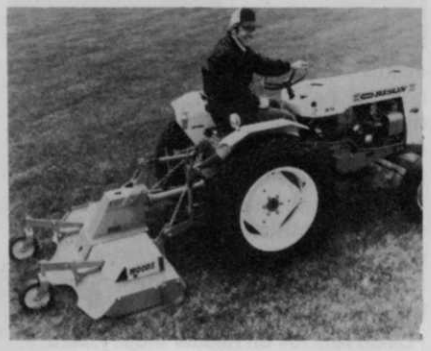
Circle No. 150 on Reader Inquiry Card

Pickseed West, which has the marketing rights to Agram chewings fescue, is now marketing this seed. It has excellent turf quality and medium dark green color, and is rated above average for disease resistance. Agram will fit well in lawn shade mixtures and in any mixture which requires a low maintenance turf grass.

The company has also begun marketing Exeter colonial bentgrass again. It has been regarded as a low maintenance turf with medium dark green color, very fine leaf blade, and can thrive at low cutting heights. It adapts to a wide range of soil types and requires little maintenance.

Circle No. 151 on Reader Inquiry Card

A gear-driven rear mount lawn mower, the RM 500 from Woods, Div. of Hesston Corp., comes with three blades and blade spindles with lubricated tapered roller bearings for long, maintenance-free operation. It also features a cast, heavy-duty gear box for rugged rotary mower use. Gears are



forged steel and heat treated.

Three high speed, alloy spring steel blades will cut a 5-foot swath and lift grass for clean even cutting. Free-floating hitch suspension allows the mower to follow uneven terrain, preventing scalping.

Circle No. 152 on Reader Inquiry Card

Square conformation light standard built of weathered steel combines strength and attractiveness for use in parks, golf courses, and along boulevards. Its straight shaft and mastarm mounted at a 90 degree angle accommodate many models of luminaires.

Continues on page 62

INTERNATIONAL SOCIETY OF ARBORICULTURE

(formerly International Shade Tree Conference)

FIFTY-SEVENTH ANNUAL CONFERENCE

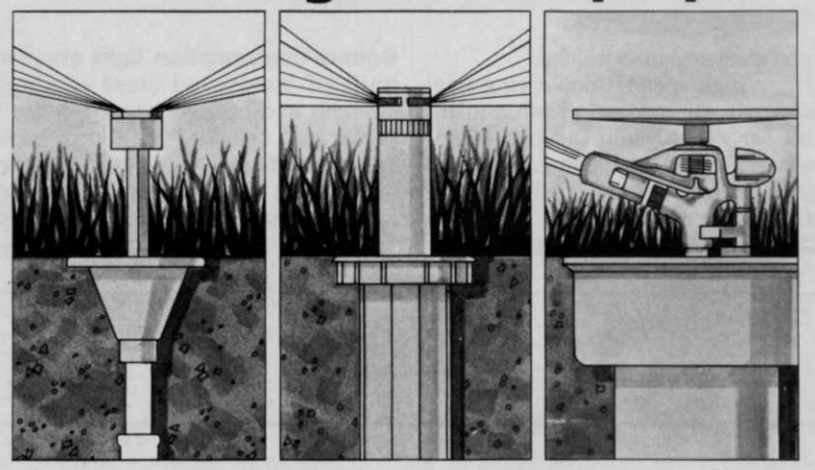
Boyne Mountain Lodge, Boyne Falls, Michigan

August 9-12, 1981

EXHIBITION AND DEMONSTRATION OF
TREE PRESERVATION EQUIPMENT
TOOLS and MATERIALS

Address communications to E.C. Bundy, Executive Director
International Society of Arboriculture
P.O. Box 71, Urbana, Illinois 61801
Tel. AC (217) 328-2032

The taller the grass ...the higher we pop!



From residential to light commercial turf installations, Champion has a pop-up to do the job! When you compare the cost, precision construction and performance, you'll buy Champion. The 18HP (2" pop-up), the P180 (2½" pop-up) and the 6178 Impulse pop-up are just three of over one-hundred fifty sprinklers, valves, controllers and accessories featured in the new Champion, full-color catalog. Ask for your free copy.

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Circle No. 110 on Reader Inquiry Card

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- Hydraulic mixing giving proper suspension of materials
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Available with 1" non-collapsible hose & electric reels for a single man operation.

Electric start engines

950 gal.

1500 gal. goose neck, also available in skid model.

SOLARCELL LAND AND BUILDING CORPORATION
412 113th Street / Arlington, Texas 76011 / 817-640-1488

Circle No. 140 on Reader Inquiry Card

Products *from page 61*

Called the Futura by Millerbernd Manufacturing Co., the light standard has a pleasing dark finish which never needs painting and "heals itself" when scratched.

A tapered base flows into the shaft with no projections or crevices to catch dirt, salt, or moisture. All mounting bolts and nuts are enclosed to improve the appearance and discourage vandalism.

Circle No. 153 on Reader Inquiry Card

Riding greens mower, the new Greens King IV by Jacobsen, can backlap reels and bedknives in place when its dual rotation hydraulic motor is shifted into reverse. Each of the three reel units op-

erates on individual control. Vehicle control has been improved and fuel tank capacity is now eight gallons. Other features of the 14-hp mower are a repositioned steering wheel and operator seat, maneuverable rear wheel steering, cutting units that follow ground contours, a differential acting hydraulic drive, and wide pneumatic tires that eliminate tire marks on turf.

Circle No. 154 on Reader Inquiry Card

Soil moisturizer Terra-Sorb cuts watering frequency up to 50 percent; shortens transplant recovery; encourages root systems to develop faster; and turns inventories quickly. Each tiny "sponge" of the material absorbs 200 times its weight in water, releasing it on demand to root systems. Industrial Services International, Inc. makes Terra-Sorb for use in many nursery and landscape jobs.

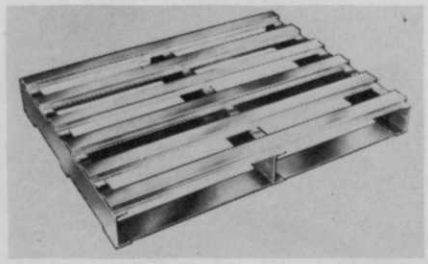
Circle No. 155 on Reader Inquiry Card

Plant caddy offered by the Phillips Products Co. allows large houseplants to be moved easily from one location to another for sunlight, cleaning, or decorating.

The plant caddy has full size casters which provide free mobility, and is made of durable contoured plastic. It comes in three sizes—12 inch, 14 inch and 16 inch and is available in clear, white, or hot fudge.

Circle No. 156 on Reader Inquiry Card

Copperloy aluminum pallets resist corrosion and will not rot, warp or absorb fluids and odors. Solid, all-welded construction ends problems of bolts,



screws, and nails which could come loose. Copperloy Corp. makes them in standard capacities to 3,000 pounds; others available on request.

Circle No. 157 on Reader Inquiry Card

Continues on page 64

AW, CUT IT OUT

Terraclor for Rhizoctonia Control	Southern Pine Seedlings — Rhizoctonia Needle Blight	Camellias — Flower Blight	Azaleas — Petal Blight	Bedding Plants — Stem Rot	Bulbs — Crown Rot, Black Rot	Easter Lilies — Root Rot	Roses — Botrytis, Storage Rot	Lawn Grasses — Brown Patch
Terrazole for Pythium Control		Herbaceous and Woody Plants — Pythium-caused Rot, Damping-off		Bedding Plants — Pythium-caused Stem Rot, Damping-off	Lawns — Cottony Blight, Grease Spot, Damping-off		Tropical Foliage Plants — Pythium-caused Stem Rot, Damping-off	

For more information on how to cut out fungal diseases in turf and ornamentals.

Your turf and ornamentals need moisture to survive. However, wet weather brings out the worst in your soil. Fungal diseases like damping-off, blight and rot. Diseases that can stunt or weaken your plants.

Terraclor® and Terrazole® soil fungicides protect the value and beauty of your turf and ornamentals. Give you healthier, stronger plants, that are more beautiful.

Get Terraclor or Terrazole from your local chemical supplier.

For more information cut out and mail the coupon.

Terraclor, Crop Protection Chemicals
P.O. Box 991, Little Rock, Arkansas 72203

Name _____

Address _____

City _____

State _____ Zip _____

Please send information on turf and ornamental disease control.

Caution: Read and follow label directions carefully.

Terraclor is also registered for the control of snow mold in turf grasses in the states of Illinois, Indiana, Michigan and Minnesota.

Terraclor®
soil fungicide

Olin

Circle No. 133 on Reader Inquiry Card

Does your turf make your reputation good as gold?

It does if it's seeded with Pennfine Perennial Ryegrass. Since its development by Penn State University in 1970, Pennfine has become the number one selling fine-leafed perennial ryegrass in the nation. And the thousands of turf professionals who continue using Pennfine are the biggest vote of confidence. You'll find top-quality Pennfine competitively priced and in ready supply. Pennfine Perennial Ryegrass, P.O. Box 923, Minneapolis, MN 55440

Circle No. 134 on Reader Inquiry Card

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CUTRINE-PLUS Algaecide, liquid or granular is **tops** for use in golf course and park ponds, lagoons, lakes. Rated **best** by groundskeepers, **CUTRINE-PLUS** liquid **effectively controls** pond scum, "moss" and pea soup algae. The granular is **outstanding for** destroying chara, nitella and other bottom-growing filamentous algae.

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Circle No. 104 on Reader Inquiry Card

Products *from page 63*

Skid steer loader model 9C from Hydra-Mac is equipped with a 25-horsepower gasoline engine and can handle loads of 900 pounds. The 9C

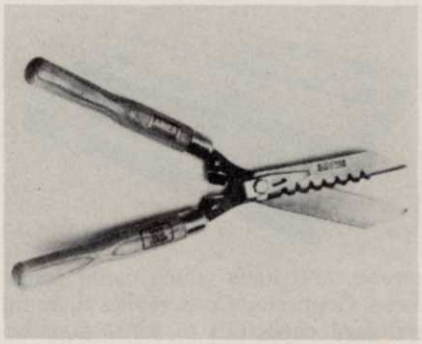
features dual hydra lever controls, fully hydrostatic all-gear final drive, front protector gates and heavy-duty plate steel frame. The 9C also has an extra wide canopy for operator comfort while maintaining the machine's compact size.

Circle No. 158 on Reader Inquiry Card

High-pressure pumps, the belt-driven Models 5340BD/5341BD, come from Hypro Division of Lear Siegler. The pumps are useful for high-pressure cleaning and also help where pressure is needed for long discharge lines. Pump components include a pressure-tested cast iron housing, stainless steel shaft with heavy-duty ball bearings, and plunger-type stainless steel piston assemblies. These units mount directly on the tractor PTO shaft. The PTO speed is positively accelerated to the pump through double ball-bearing-supported pulley shafts and two matched polyflex belts.

Circle No. 159 on Reader Inquiry Card

A hedge shear, No. 23-016, has been added to the Ames line of tools. The Miracle blade features forged bevels,



hand-ground serrations, precision-honed cutting edges, and hollow-ground steel.

Circle No. 160 on Reader Inquiry Card

We put a lot into our Turf-Truckster.

One of the most dependable vehicles for moving your crew around is the 3- or 4-wheel Cushman® Turf-Truckster.® But it was also designed for more than just transportation.

Equipped with an optional PTO and hydraulic system, both models accept a wide range of special, add-on turf maintenance equipment. So with just one Turf-Truckster you can haul, dump, grade, seed, spray, spread, top dress, and aerate. Plus, we've increased the payload capacity of the Turf-Truckster to 1,500 pounds.* So you can carry more than ever before.

But there's more to a Turf-Truckster than versatility. There's a rugged 18-hp engine that's built to take on your turf. It comes with a standard 2 to 1 auxiliary transmission. A transmission built to allow a gear driven PTO to be attached directly to it. And common sense engineering makes the Turf-Truckster steer clear of the repair shop, too.

The 3-wheel model gives you the maneuverability of a tight 17' turning circle, while the 4-wheeler has seating

room for two. And it just takes minutes to add any of the Turf-Truckster's accessory pieces, thanks to Cushman's pin-disconnect system. No bolting, no hitching. Just snap two or three pull pins in place and you're ready to hit the turf.

If a good transportation/hauling vehicle is all you need, though, look at the Cushman Runabouts. There's an 18-hp two-seater, and a fuel-stingy 12-hp one-seater model. Both Runabouts are economical to own. And like any Cushman vehicle, they're built tough.

There's nothing like a Turf-Truckster or Runabout to get more work done, in less time and with less manpower. For a closer look at what goes into, or behind, a Cushman vehicle, return this coupon today. 81-CUT-4

*Rating for vehicle equipped with 9.50-8 rear tires.

Show me what you put into a vehicle, Cushman.

☐ I'd like a demonstration of the Turf-Truckster (3-wheel or 4-wheel). (Circle One)

☐ I'd like a demonstration of the Runabout (12-hp or 18-hp). (Circle One)

I'm interested in seeing these Turf-Truckster attachments: ☐ Aerator; ☐ Sprayer; ☐ Top Dresser; ☐ Grader/Scarifier; ☐ Flatbed/Dump Box; ☐ Cyclone Seeder/Spreader.

☐ Send me your new 1981 catalog.

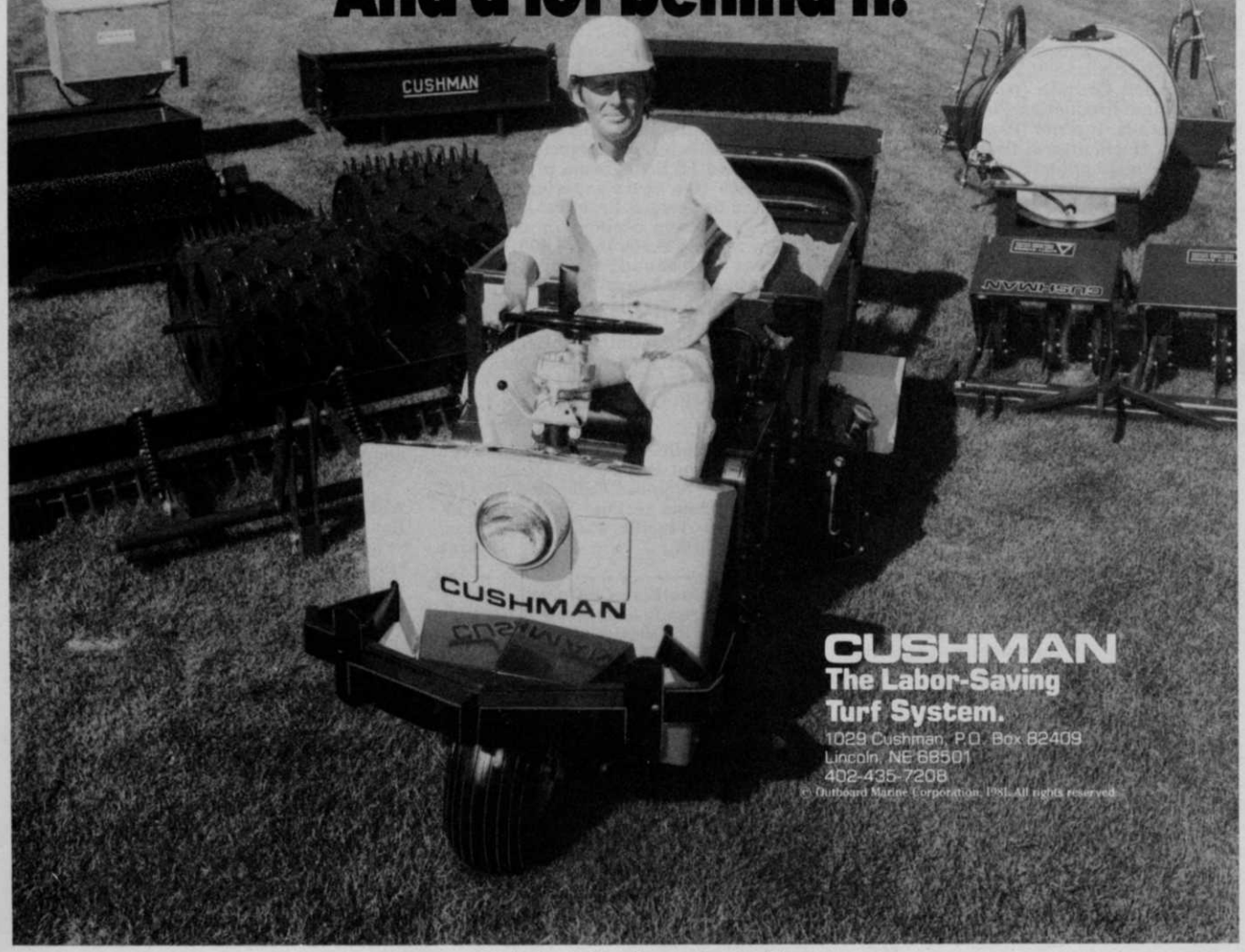
Name

Title

Address

City State Zip

And a lot behind it.



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Circle No. 112 on Reader Inquiry Card

WT&T

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BOX NUMBER REPLIES: Mail Box number replies to: WEEDS, TREES & TURF, Classified Ad Department, 120 W. 2nd St., Duluth, MN 55802. Please include box number in address.

HELP WANTED

WANTED: Firewood Distributors for energy conservations company. Inventory investment range — $2000 to $10,000 — depending on location. Serious replies to: HOME FIREWOOD, P.O. Box 141 Sta. B., Hamilton, Ontario L8L 7O7 Canada. 6/81

Instructor/Assistant Professor of Applied Plant Science to begin September 1, 1981. To teach such horticultural courses as Controlled Growth Structures, Spring Transplant Production. Floricultural Crop Production, Interior Plants and Plants caping, Horticultural Practices, Applied Entomology, Applied Soil Technology, and Horticultural Therapy. Assist in arranging summer work experience for students, assist in horticultural facilities operations, and willing to participate in possible part-time instruction during summer term. Qualifications: Masters degree in plant science with a strong leaning toward practical applications: Should have at least three years of commercial or other field experience in plant science, preferably in greenhouse production/management. Contact by June 15, 1981 Dr. L. Roberts, Jr., Director Thompson School of Applied Science, Barton Hall, University of New Hampshire, Durham, N.H. 03824. The University is an Affirmative Action/Equal Opportunity Employer. 6/81

LANDSCAPE PROJECT MANAGER. We are actively seeking individuals with extensive experience in large-scale landscape, irrigation and site development projects. Background in public works procedures required. Top salary and benefits. **GRAYLAND DEVELOPMENT, INC.,** City of Industry, CA., (213) 961-9256. 7/81

LANDSCAPE GENERAL SUPERINTENDENT. Individual required to coordinate all field operations for expanding landscape contracting firm. Knowledge of scheduling, equipment utilization and large-scale public works projects required. Only those skilled in the above need call. **GRAYLAND DEVELOPMENT, INC.,** City of Industry, CA. (213) 961-9256. 7/81

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BRANCH MANAGER: Chemical Lawn Care firm is accepting applications for Managerial position. Must be experienced in route and service type business, responsible for sales personnel and administration. Must be willing to relocate in Ohio, Indiana or Kentucky areas. Write WTT Box 270. 11/81

Lead Research Scientist — Southern California. Plans, supervises and conducts professional scientific studies for Hydrilla Verticillata Eradication Program. PhD., MA, or MS in Plant Physiology, Botany, Weed Science or Agronomy, with studies in areas of Aquatic Weed Control. Contact Imperial Irrigation District, Personnel Dept., P.O. Box 937, Imperial, CA 92251. Telephone (714) 355-1112, Ext. 250. An Equal Opportunity Employer. 6/81

INSTRUCTOR — SCHOOL OF GOLF COURSE OPERATIONS. LAKE CITY COMMUNITY COLLEGE, located in the pine forest of North Florida, is searching for an individual to teach courses in irrigation and drainage, turfgrass science, soils and other related subjects. Minimum requirement: B.S. degree in plant science field with two years experience in golf course maintenance. Practical knowledge of irrigation and drainage is necessary. Salary range $16,500 to $24,900, depending upon degrees and years of experience. Date to be filled: August 1981. Send inquiries directly to Jerry H. Cheesman, Director; School of Golf Course Operations, Lake City Community College; Rt. 7, Box 42; Lake City, FL 32055. AN EQUAL OPPORTUNITY/AFFIRMATIVE ACTION EMPLOYER. 7/81

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Continues on page 68

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New Trailblazer™ cleans up to 7¼ acres per hour

Sweeps turf/hard surfaces

At last! A rugged all-terrain sweeper that can clean both your turf and hard-surfaced areas. Provides productivity undreamed of before. TENNANT® Trailblazer™ sweeps up to 3 acres of turf or 7 acres of hard surfaces an hour.

This tough, versatile sweeper combines the "lifting action" of a powerful vacuum with the "grabbing action" of a brush or paddle—to pick up paper litter, sand, cans, leaves, sticks, pine needles, even loose thatch. Has more pickup power than any turf machine. Cleans a 60" path

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Pressure-packs debris to maximize hopper capacity.

(up to 92" with optional dual side brushes).

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Dumps its load at any point from ground level to 6 ft.—directly into containers or dump trucks. A 500 sq. ft. filter system provides nearly dust-free operation.

Optional cab enclosure and pressurizer for optimum operator comfort. Vacuum wand/blower available for cleaning along parking curbs, fences and other areas that might ordinarily require a separate specialized machine. Choice of gas or diesel engine. For a free, colorful brochure, write: Tennant Company, 701 N. Lilac Dr., P.O. Box 1452, Minneapolis, MN 55440.

Dumps from ground level to 6 ft.—directly into containers, dump trucks.

Call Toll Free: 800-328-5727 Ext. 768G

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WANTED

Vermeer T-66 Lawns By Murphy, 2715 N.W. 69th, Oklahoma City, Oklahoma 73116 (405) 842-7177. 6/81

WANTED: A complete set of issues of Weeds, Trees and Turf for the years 1977, 1978, 1979. CONTACT: M.R. Gardner, Suite 15, 1600 West 6th Avenue, Vancouver, B.C., Canada, V6J 1R3. 6/81

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COMPANY _____
STREET _____
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ADVERTISERS

ADVERTISER	Page
Allied Chemical Corp.	11
Andersons, The	25, 47
Applied Biochemists, Inc.	64
Barebo, Inc.	56
BASF Wyandotte Corp.	41
Brouwer Turf Equipment Ltd.	17
J I Case	5
Caudell Seed Co.	42
Champion Brass	62
Chevron Chemical Co.	13
Cushman	65
Diamond Shamrock/ Ag Chem.	2, 3
Ditch Witch Equipment	43
Dow Chemical U.S.A.	34, 35
Environmental Design Press	52
FBC Chemicals, Inc.	15
Flexitube Int'l Corp.	24
Glenmac, Inc.	17
Heckendorn Mfg. Co.	46
Hoffco Inc.	50
Hoffman-LaRoche, Inc.	1
Hopkins Agricultural Chem. Co.	58
Hypro/Div. Lear Siegler Inc.	52
Int'l Society of Arboriculture	61
Jacobsen	7
Lofts Pedigreed Seed Co.	Cover 4
Magline Inc.	39
Mobay Chemical Corp/ Ag Chem. Div.	48, 49
Mobile Aerial Towers, Inc.	37
Monsanto	57
Mott Corporation	24
Northrup King	38
Olin Corporation	63
Pennfine Perennial Ryegrass	64
Pennwalt Corporation	53
Pickseed West	29
Princeton Mfg. Co.	51
Rain Bird Sprinkler Mfg. Corp.	Cover 2
Safe-T-Lawn Inc.	45
Solarcell Land & Building	62
Telsco Industries	56
Tennant Company	67
3M Company	54, 55
Toro Company	Cover 3
Union Carbide Agr. Prod. Co.	19
Velsicol Chemical Corp.	54
Warren's Turf Nursery, Inc.	26

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WE MADE OUR SPINDLE UNSPINDLY.

TO KEEP YOU CUTTING.

Toro works hard to give you the kind of riding rotary mower you want most.

A mower that keeps you cutting. Gets the job done.

In fact, we get down to the tiniest details to produce a totally durable mower.

For example, we designed an unspindly spindle to turn the blades of our Groundsmaster 72® and Groundsmaster 52® mowers.

First, we made its housing a rugged cone shape, not cylindrical like other makes. To tolerate greater stress and bombardment by rocks and other debris.

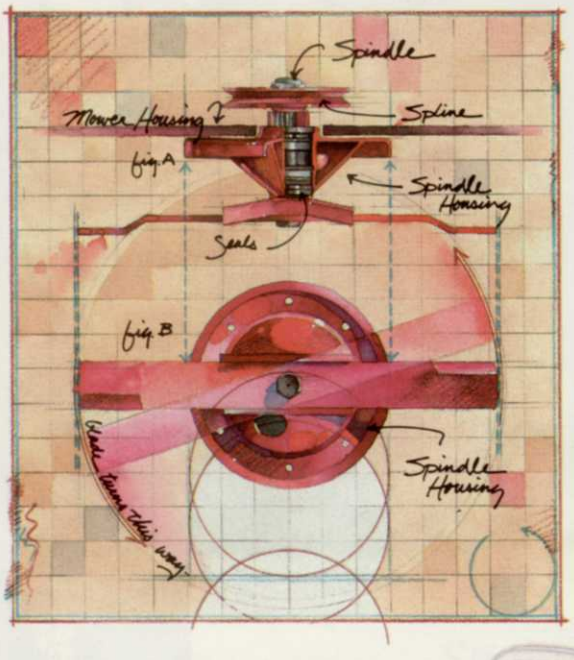
Next, we specified Timken "SS type" roller bearings, not just ordinary ball bearings. They take more thrust and are less likely to damage the bearing housing, fall out and have to be replaced. And they don't need adjustment for proper seating.

Then, we put splines rather than keys in the shaft and pulley. These machined grooves mesh like gear teeth all around, won't slip, and they wear much better and longer than key type systems.

Teamed up with more conspicuous durability features like hydrostatic drive and a Donaldson air cleaner, our unspindly spindle keeps you cutting longer and stronger.

Call your Toro® distributor. He'll tell you all you want to know about Toro riding rotary mowers.

Right now.



TORO®

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THE PROFESSIONALS THAT KEEP YOU CUTTING

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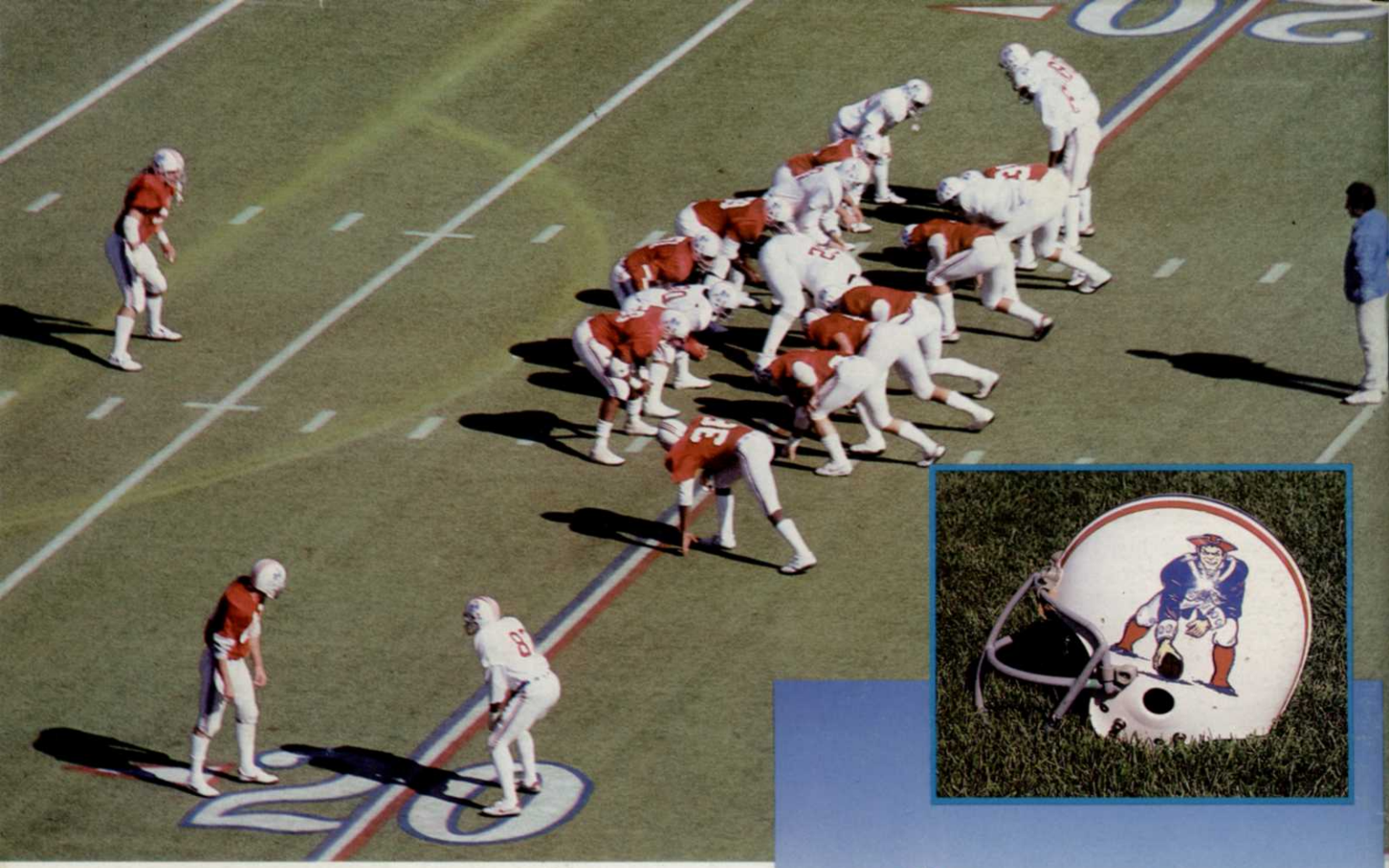

Need a bluegrass that can take a beating? Do what the Patriots did . . .

GO WITH baron

KENTUCKY BLUEGRASS

When the New England Patriots decided to put in a practice field, experts were called in. They turned to Bob Drake of Chester Drake & Son and Chris Beasley of Tuckahoe Turf Farms. The decision wasn't too difficult.

A sod was chosen which included 60% Baron. It had a root structure that would really hold together when the sod was installed. And it would look good. But most important, this turf would take the daily beating from some very rough football players.

Whether you need seed or sod, stick with a winner . . . Baron.

(Above) Chris Beasley of Tuckahoe Turf Farms, Barry Stewart of the New England Patriots and Bob Drake of Chester Drake & Son take another look at the fine quality and dense root structure of the Baron sod as it's installed on the Patriots' practice field.

(Right) Jerry Zuccala of Lofts/New England discusses the high quality performance Barry Stewart can expect from the Baron sod.

LOFTS

Lofts Pedigreed Seed, Inc.
Bound Brook, New Jersey 08805 (201) 356-8700

Lofts/Maryland
Landover, MD 20785
(301) 322-8111

Lofts/New York
Cambridge, NY 12816
(518) 677-8808

Lofts/New England
Arlington, MA 02174
(617) 648-7550

Loft-Kellogg Seed Co., Inc.
Milwaukee, WI 53201
(414) 276-0373

Great Western Seed Co., Inc.
Albany, OR 97321
(503) 926-5892

Sunbelt Seeds, Inc.
Tucker, GA 30084
(404) 491-1311

Canadian Distributor:
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Brampton, Ontario L6V2L2
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